Initial Environmental Examination

Project Number: 46391-001
August 2016

VIE: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project

Prepared by Hanoi Power Corporation for Asian Development Bank.

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Loan 3161-VIE: Ha Noi and Ho Chi Minh City Power Grid Development Sector Project

Subproject: Increasing the capacity of transformer T2, renovating bay of 110kV Tia substation - E10.4 in Hanoi

Prepared by Hanoi Power Corporation for Asian Development Bank

ABBREVIATIONS

ADB:	Asian Development Bank
AH(s):	Affected Household(s)
AP(s):	Affected people(s)
BOD:	Biochemical Oxygen Demand
CTF:	Clean Technology Fund
COD:	Chemical Oxygen Demand
CPC:	Commune People's Committee
CSC:	Construction Supervision Consultant
DARD:	Department of Agriculture and Rural Development
DoNRE:	Department of Natural Resources and Environment
DoCST:	Department of Culture, Sports and Tourism
DoLISA:	Department of Labour, War Invalids and Social Affairs
EA:	Executing Agency
EIA:	Environmental Impact Assessment
EMP:	Environmental Management Plan
EO:	Environmental Officer (of PMB)
ES:	Environmental Staff (of contractors)
EVN:	Viet Nam Electricity
EVN*HANOI*:	Ha Noi Power Corporation
EVN*HCMC*:	Ho Chi Minh City Power Corporation
FFC:	Front Fatherland Committee
GHG:	Greenhouse gas
GRM:	Grievance Redress Mechanism
HCMC:	Ho Chi Minh City
HANOI DPMB:	Hanoi Development Projects Management Board
HN:	Ha Noi
IA:	Implementation Agency
IEE:	Initial Environmental Examination
MARD:	Ministry of Agriculture and Rural Development
MoLISA	Ministry of Labour, War Invalids and Social Affairs
MoNRE:	Ministry of Natural Resources and Environment
NPA:	National Protected Area
PCB:	Polychlorinated biphenyls
PCR:	Physical Cultural Resources
PIC:	Project Implementation Consultant
PPC:	Provincial People's Committee
PMB:	Project Management Board
PO	Project Owner
REA:	Rapid Environmental Assessment
ROW:	Right-of-way
RP:	Resettlement Plan
S/S:	Substation
T/L:	Transmission line
TSS:	Total Suspended Solids
UXO:	Unexploded Ordnance

CURRENCIES

(Rate of exchange of 28March. 2016)

Currency Unit	–	VND
$1.00	=	22,355 VND

NOTE

In this report, "$" refers to US dollars unless otherwise stated.

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2. The 110kV Tia substation subproject in Hanoi city which is one of 29 non-core subprojects of the EVN proposed by Hanoi Power Corporation (EVNHANOI) and Ho Chi Minh City Power Corporation (EVNHCMC). These 29 non-core subprojects were classified Category B for environment. This subproject consists of expansion of Tia 110kV substation to renovate and build 06 new 110 kV outgoing bays according to 2 busbars map with contact breaker. The IEEs of the other non-core subprojects are prepared separately.

A. Subproject Summary

3. Under this subproject Tia 110kV substation will be expanding the area to the west and south of the existing premises, as follows: substation's land use will be expanded toward the front of station (West, Southern direction) 20.5 m x111.5m and to the right (South) 35.3mx59m which is enough to renovate and build 06 new 110 kV outgoing bays according to 2 busbars map with contact breaker as planned. The total expansion area is 4,039m^2 including 2.916,3m^2 campus expansion area, 1,122.7m^2 is returned residential roads outside the substation's fence, embankment slope and retrieving intertwined land.

4. The extension area includes mainly ponds, only a small portion of rice fields; therefore, it is very convenient for expanding the area of the substation. The original station area was 4.105,5m^2, the area inside the fence after the expansion station is 7021.8 m^2.

B. Potential Impacts and Mitigation Measures

5. The IEE of 110kV Tia substation indicates that the potential environmental impacts of the subproject are restricted in the construction phase of the subproject components. The common construction-related disturbances such as noise, dust, sedimentation, solid and liquid waste pollution, worker camp issues, reduced access, increased vehicles/transportation means and traffic road disruptions, increased risk of worker and resident injury can be managed with standard construction practices and management guidelines (e.g., IFC/World Bank 2007). After the field survey, interview, consultation, the subproject doesn't cross over any National Park, Nature Reserve or area planned for Nature Reserve. There are no rare or endangered wildlife, critical habitats or protected areas in the subproject site. The subproject site is located in the areas of paddy rice, and fish ponds of the local residents.

6. Total acquired land for construction is 4,060.92m^2 including 124.5m^2 agricultural land of 2 households with 8 inhabitants and 3,936.42m^2 public land (aquaculture land) under the management of To Hieu People's Committees (PC) with 6 households who are using this public land. Acquired land area and compensation for damages is addressed in details in the Resettlement Plan (RP) prepared in a separate volume.

7. The construction-related disturbances to environment and community are mainly the short-term disturbances caused by constructing the substation expansion area. No cumulative environmental impacts will be occurred. Mitigation measures for these impacts are stated in details in Part VI of this report.

8. The Environmental Management Plan (EMP) prepared for the subproject provides comprehensively impacts, mitigation measures and environmental monitoring plan to minimize and manage the potential impacts of the subproject. The EMP also prescribes an emergency response plan for the construction sites and identifies the need for capacity development and training of the IA/EO (belonging to the PMB) in environmental management and assessment as focused on the implementation of the EMP.

C. Conclusions

9. The IEE concludes that the feasibility study establishment of the subproject combined with available information on affected environment is sufficient to identify the scope of potential environmental impacts of the subproject. In technical design phase, significant changes to the subproject description do not occur, thus new potential environmental impacts, sensitive cultural issues are not arisen, and further detailed environmental impact assessment (EIA) is not required.

II. INTRODUCTION

A. Background of the IEE

10. Ha Noi and Ho Chi Minh City Power Grid Development Project aims to strengthen the capacity and reliability of the power infrastructure in Ha Noi and Ho Chi Minh City, Viet Nam through the rehabilitation and development of the 220kV and 110kV high-voltage power transmission systems and substations and associate to medium voltage supply for the power distribution system of the two cities. The Project also aims to strengthen the institutional capacity of Ha Noi Power Corporation (EVNHANOI) and Ho Chi Minh City Power Corporation (EVNHCMC). Additionally, the project includes a smart grid component financed by the Clean Technology Fund (CTF).

11. The Project in Ha Noi and Ho Chi Minh City consists of 29 non-core subprojects that were originally defined by the Viet Nam Electricity (EVN).

12. This IEE is prepared for the new-constructed subproject of 110kV Tia Substation which is expected to be constructed in Tu Duong village-To Hieu commune- Thuong Tin District-Hanoi city. The IEEs of the other non-core subprojects are prepared in separate volumes.

B. Assessment Context

13. The subproject was classified as category B environment under the ADB's Safeguard Policy Safeguard Policy Statement-2009 which will have potential adverse impacts that are less adverse than the impacts of category A project and can be mitigated with an environmental management plan.

14. This IEE is prepared for Tia substation subproject in the detailed design for 110kV Tia Substation subproject using available data and information on sensitive ecological and cultural objects that exist for the subproject site.

III. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

15. 110kV Tia Substation will be implemented under the directions for use of Official Development Assistance (ODA) of the GoV, Decree No. 38/2013/ND-CP dated April 23rd, 2013 on directions for management and use of Official Development Assistance (ODA) and concessionary loans of Donors, and in accordance with the provisions of the Project.

A. Viet Nam Legislations for Environmental Assessment

16. Law on Environmental Protection of Vietnam (2014) prescribes the requirements for environmental assessment for developing domestic projects and considering impacts on natural and social environment.

B. Applicable Environmental Policies, Laws, Decrees, and Standards

17. The following are key directions for environmental assessment and protection in Viet Nam:

Legal documents on environment protection

- Environmental Protection Law No.55/2014/QH13 of the 13th National Assembly, the 7th Session, passed on Jun. 23th, 2014 and put into force from Jan. 1st, 2015.
- Decree No. 18/2015/ND-CP dated February 14, 2015 of the Government on Regulating Strategic Environmental Assessment, Environmental Impact Assessment and Environmental Protection Commitment;
- Circular No.36/2015/TT-BTNMT dated June30th, 2015issued by the MONRE regarding the hazardous wastes management.
- Circular No.27/2015/TT-BTNMT dated on 29 May 2015 on strategy environmental assessment, environmental impact assessment, and environmental protection plan

Legal documents on electricity

- Electricity Law No. 28/2004/QH11 dated Dec. 03rd, 2004.
- Law on modification, supplementation on some articles of the Electricity Law No. 24/2012/QH13 issued by the National Assembly of the Socialist Republic of Vietnam, dated Nov. 20th, 2012.
- Decree No.14/2014/ND-CP dated Feb. 26th, 2014 promulgated by the GOV regarding the detailed regulation on the implementation of the Electricity Law on electric safety, put into force from Apr. 15th, 2014.
- Circular No.31/2014/TT-BCT dated Oct. 2nd, 2014 issued by the Ministry of Industry and Trade (MOIT) regarding the detailed regulation on some contents of electrical safety.

Other related legal documents:

- Decree No. 45/2013/ND-CP dated May 10th, 2013 of the GOV regarding the detailed regulation on some articles of the Labor Code on working hours, rest hours, occupational safety and occupational hygiene.
- Circular No.22/2010/TT-BXD dated Dec. 3rd, 2010 issued by the Ministry of Construction (MOC) regarding the regulation on labour safety during the project construction process.
- Decision No.3733/2002/QD-BYT issued by the Ministry of Health dated October 10th, 2002 regarding the promulgation of 21 labour hygiene standards, 5 principles and 7 labor hygiene measurements.

Environmental Standards and Regulations

- QCVN 05:2013/BTNMT - National technical regulation on ambient air quality;
- QCVN 26:2010/BTNMT - National technical regulation on noise.
- QCVN 27:2010/BTNMT - National technical regulation on vibration.
- QCVN 08:2015/BTNMT - National technical regulation on surface water quality.
- QCVN QTD-5: 2009/BCT - National technical regulation on electrical engineering - electrical equipment verification of the system.
- QCVN QTD-6: 2009/BCT - National technical regulation on electrical engineering - electrical equipment maintenance, repair and operation of the system.
- QCVN QTD-7: 2009/BCT - National technical regulation on electrical engineering - Power project construction.
- QCVN 07:2009/BTNMT - National technical regulation on hazardous waste thresholds.

Directions of Electricity Industry in Viet Nam and Information for 110kV Tia Substation

- Decision No. 5193 / QD - EVN HANOI dated December 30, 2014 of the Hanoi General Electric Company on approving investment projects in construction "Increasing capacity of transformer T2, renovating bay of 110kV Tia substations - E10.4 "
- Contract No. 51 / HD - HANOI PMB dated July 12, 2012 between the Management Board of Hanoi grid projects and Northern Electricity Consulting Limited Company on the Consulting survey, setting up investment projects, Design engineering - Total cost estimates, construction drawing design, construction bidding documents "Increasing capacity of transformer T2, renovating bay of 110kV Tia substations - E10.4"

C. ADB Safeguard Policy

18. The ADB Safeguard Policy Statement (ADB SPS, 2009) along with the ADB Environmental Safeguards, A Good Practice Sourcebook, 2012, clarifies the rationale, scope and content of an EA and supported by technical guidelines (e.g., Environmental Assessment Guidelines, 2003). Projects are initially screened to determine the level of assessment that is required according to the following three environmental categories (A, B, or C).

Category A: is assigned to projects that normally cause significant or major environmental impacts that are irreversible, diverse or unprecedented such as hydroelectric dams (an Environmental Impact Assessment is required).

Category B: projects have potential adverse impacts that are less adverse than those of category A, are site-specific, largely reversible, and for which mitigation measures can be designed more readily than for category A projects (an Initial Environmental Examination is required).

Category C: projects are likely to have minimal or no negative environmental impacts. An environmental assessment for Category C projects is not required but environmental implications need to be reviewed.

19. The 110kV Tia Substation is assessed as category B which is necessary to prepare an IEE. Appendix A presents the Rapid Environmental Assessment (REA) of the subproject.

IV. DESCRIPTION OF SUBPROJECT

20. The 110KV Tia Substation non-core subproject consists of two major components that are (i) substation expansion and construction, (ii) electricity equipment installation (renovate and build 06 new 110 kV outgoing bays according to 2 bus bars scheme with contact breaker)

1. Substation expansion and construction

21. 110kV Tia substation is located behind Thuong Tin electricity power company at To Hieu Commune, Thuong Tin District, Ha Noi city. It bounded by Thuong Tin Electric Power Company and the company's dormitory to the North, by a small road to the East, by residential area to the West and by a fish pond to the South. Under this subproject Tia 110kV substation will be expanded its area 16 m to the West and 35.3 m to the South

22. Substation's land use will be expanded toward the West for 16m x111.5m and to the South35.3mx59m which is enough to renovate and build 06 new 110 kV outgoing bays according to 2 bus bars map with contact breaker. Station's existing area is 4.105,5 m^2. The total expansion area is 4,039m^2 including 2.916,3m^2 of station expansion area, 1,122.7m^2 is returned residential roads outside the station's fence, embankment slope and retrieving intertwined land.

23. Acquisition area of 216.32 m^2 land for the construction of 02 new 110 kV feeders columns outside the station's fence. Station will be levelled to fit existing station's foundation.

24. The construction part includes:

- Construction of new control house size 8,7m x 31.5 m. Houses is designed with 1 basement with 2.5 meters high and 2 floors with the height of 4.2 m for 1st floor, and 3.6 m in height for 2nd floor;
- Construction of new kinds of foundation pillars for outdoor power equipment - 0,7m x 0,7m foundation;
- Construction of outdoor new cable trench systems;
- Replace the existing grounding system with a new grounding system.
- Construction of a new oil accident tank to replace the existing oil tank which will be demolished to build the 110kV outgoing bay.
- Construction of a new emergency spilled oil tank at station's corner, demolition of existing oil tank to build the 110kV outgoing bays;
- Construction of 02 last 110 kV columns with N111-25C steel along 110kV transmission lines coming straight from Van Dinh and Van Dien;
- Move and build the 35kV, 22kV feeders' columns, build additional 7 columns and foundations.

2. Electrical equipment component

25. The technical specification of electrical equipment are presented in Table 1

Table 1 The technical specification of electrical equipment component

Electricity site	Description
The 110kV	- After expanding renovated station will use the diagram 2 bar with 06 outgoing sub bar, stop highway 02 transformers and 01 prevents the contact breaker.
The 35kV	- Collecting all outdoor 35kV distribution courtyard - Installation of a new 35 kV distribution room with 2 bus bar systems C31, C32. - Install 475m new 35kV underground cable type XLPE with cross section 3x240mm^2 for the 35kV feeders. - Reuse of the 02 rigs capacitors for the existing C31 and C32 bus bar - Newly install 1.230m of 35 kV underground cable type XLPE, copper cable core 1x400mm2 (2 fibres/1phase). - Newly install 475m of 35 kV underground cable, type XLPE, section of 3x240mm2 for 35 kV feeder.
The 22kV	- Use the whole of the main existing 22kV devices with bus bar system having 2 segments. - Copper conductor with cross section 3x120mm^2 for 24kV capacitor. - Install new 22kV voltage transformer for 02 for measuring cabinets TUC41, TUC42. - Install 02 new overcurrent relays for 22kV cabinets. - Reuse of the 01 rigs capacitors for the existing C41 bus bar - Newly install 1.272m of 24kV underground cable type XLPE, copper cable core 1x630mm2 (2 fibres/1phase). - Newly install 105 24kV underground cable type XLPE, copper cable core 3x120mm2 for 24kV compensating capacitor.

The substation location is presented in Figure 1

Figure 1. The 110 kV Tia substation

3. Construction works

a. Civil work volume

26. The excavated and filled soil is presented in Table 2

Table 2. The excavated and filled soil amount

No.	Excavating and filling activities	Amount (m^3)
1	Soil volume from excavation of 0.2 m of fish pond	- 697
2	Soil volume compensated of 0.2 m thick layer from fish pond	+697
3	Soil volume to fill existing ground to be 0.1 m higher	+329
4	Filled soil volume within the fence	+6797.5
5	Soil volume to fill public roads and slopes around the stations	+1982.3
	The total volume of filled soil	**+9,805.8**

(Source: Subproject technical design, 2015)

Thus, total volume of soil/sand to fill a expanded area of Tia substation is 9,805.8 m^3

27. During the construction phase the following infrastructures will be constructed to serve the substation construction activities:

- *Temporary road construction:* Execution of earthworks, road base reinforcement is taken place inside and outside the service station construction.
- *Water well drilling:* water wells will be drilled prior to serve the construction. Water will be used for fire protection and activities for the substation operator.
- *Warehouse construction:* Warehouse for construction is expected to be built on empty area at the construction site. The materials used for construction of warehouse are:

- Closed warehouse by bamboo, fibro- cement roofing. Cement warehouse's floor with wooden beams 0.2 m above the ground.
- Open stores by bamboo, fibro- cement roofing.
- Casting area is M100 concrete structures 100 thick, 20 thick cement mortars.
- Area to gather components: leveled and compacted.

The warehouse areas in the substation area is presented in Table 3

Table 3.The warehouses in the substation area

No.	Structures	Unit	Quantity
1	Closed warehouse	m^2	100
2	Open warehouse	m^2	200
3	Concrete structure casting area	m^2	500

(Source: Tia substation project Technical report, 2015)

Temporary camp for construction workers: the temporary worker camp with bamboo walls, fibro cement roofing will be built outside station's fence

b. Construction method

Earthwork:

- Excavation of station pole foundations, transformers' foundations by machines. Then, the pitfondations are filled upmanually
- Excavation of pillars' foundation, cable trenches, new emergency spilled oil tank ... by machines combined with manual work.
- Backfill manually

Concrete work:

- Mortar is mixed in 250L concrete mobile mixer. Concrete is compacted by compactor combined with manual work.
- Precast concrete is gathered in the yard at pre-arranged location on the construction layout.
- Steel in concrete is processed at workshops located on site

Installation of steel structures:

- Beam, steel brackets are combined and erected by machine combined with manual work.
- Device underpinning is installed manually.

c. Material demand and supply sources

28. Supply source of materials and equipment for the subproject includes two categories: domestic and abroad supply sources as follows:

- Power equipment which is imported and transported to Hanoi, and stored in a warehouse of EVNHN. Then it will be transported by road to the construction site.
- Sand volume for pond filling is about 9,805.8 m^3. This volume will be bought from local providers in Tia town
- Other materials and equipment will be domestically purchased.
- Gravel, cement, formwork, bamboo wattles are taken in the area of Hanoi
- Steel for tower foundations, lightning conductor are taken in the area of Hanoi and processed at the construction site.

- Steel towers, wire, insulators and accessories: processed at the factory and stored in a warehouse of EVNHN, which will be then transported by road to the construction site.

4. Waste treatment

29. Domestic sewage: number of construction workers for the construction work is about 30 people. The worker camp will be equipped with sanitary toilet with septic tank. Domestic wastewater will be preliminary treated before being discharged into domestic sewage treatment system of the village.

30. Domestic solid waste of workers (about 15kg/day) will be collected into dustbins and disposed at local regulated site. No refused excavated soil will be remained because all excavated soil will be used to fill an aquaculture pond, which is expanded area of the substation.

31. Regarding other construction waste, it will be treated as the following diagram (Figure 2):

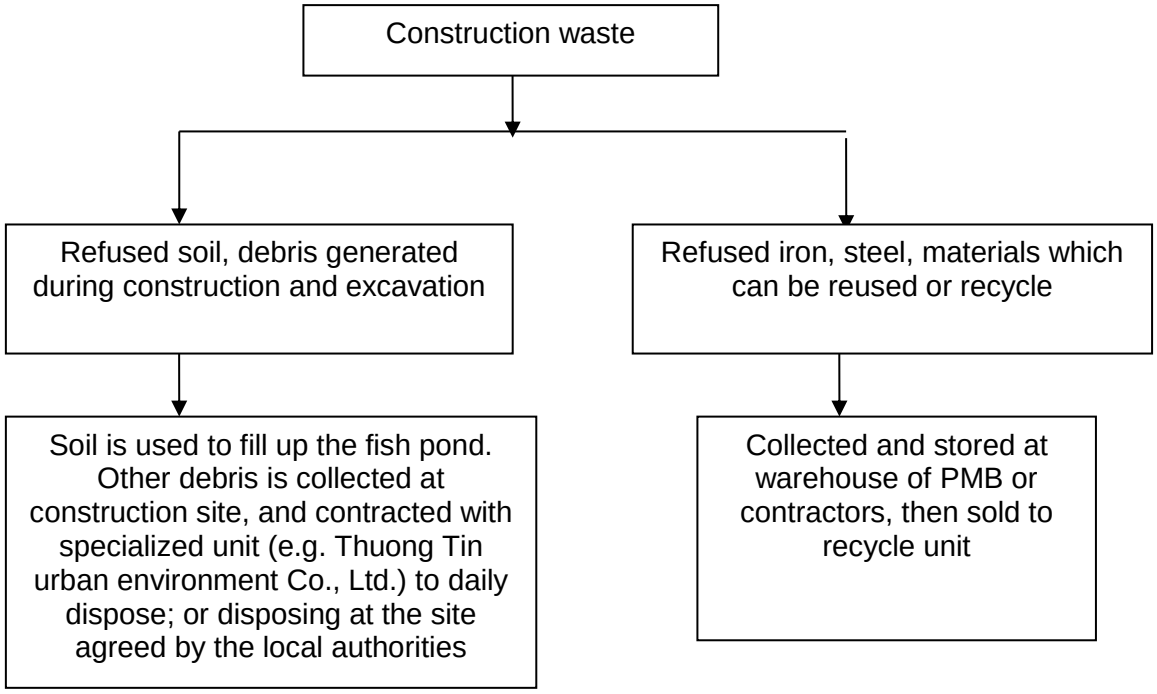


Figure 2.Management of construction waste

V. DESCRIPTION OF THE ENVIRONMENT

32. The environmental baseline information was obtained primarily from Ha Noi Statistical Yearbooks, reports from EVN's technical consultant and environmental monitoring report of Tia substation in 2015.The description of the affected environment focuses on natural features and land use.

A. Physical Environment

1. Climate

a. Temperature

33. The climate of project area in Hanoi Capital is under the influence of the Northern region characterized by humid tropical monsoon, that is, hot and rainy summer, and cold and cloudless winter. From May to October, hot and humid climate is dominant with the average temperature of 28.4oC. From November to April of the following year, cold climate is seen with average temperature of 20.1^{o}C. The values of the average temperature from 2009 to 2013 are shown in Table 4.

Table 4.Monthly average temperature from 2009 to 2013 (^{o}C)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year avg.
2009	15.4	22.0	20.6	24.1	26.4	29.6	29.1	29.2	28.3	25.9	21.2	19.5	24.3
2010	18.1	20.9	21.9	23.5	28.7	30.9	30.7	28.6	28.6	25.7	22.1	19.4	24.9
2011	12.8	17.7	17.1	23.8	27.2	29.5	29.9	28.9	27.6	24.5	23.8	17.4	23.4
2012	14.6	16.2	20.2	26.2	28.9	30.3	29.6	29.3	28.0	26.8	23.4	18.7	24.4
2013	15.3	19.9	24.0	25.0	28.9	30.0	28.7	29.1	27.0	25.6	22.8	16.3	24.4
Avg.	15.2	19.3	20.8	24.5	28.0	30.1	29.6	29.0	27.9	25.7	22.7	18.3	24.3

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013.)

34. The annual average temperature of Thuong Tin district is 23.5°C.

b. Rainfall and Humidity

35. The rainy season in the Hanoi area occurs in the period from May to October. Months with the largest rainfall are usually July or August associated with tropical storm season in the Red River Delta. The smallest monthly rainfall is in February. The average rainfall from year to year is 1.639,9 mm. The largest monthly rainfall is 541.4mm in 2009-2013 periods (appearing in Aug 2013). Monthly and yearly rainfall average is shown in the Table 5.

Table 5. Monthly rainfall in Hanoi (mm)

Y \ M	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	4.5	6.5	36.5	54.5	234.5	232.5	505.0	95.0	179.5	78.0	0.5	0.0	1427.0
2010	80.9	8.1	5.8	55.6	149.7	175.4	280.4	274.4	171.8	24.9	0.6	11.6	1239.2
2011	9.3	17.5	105.9	42.0	149.0	388.3	255.3	313.2	247.3	177.6	31.8	51.5	1788.7
2012	20.3	16.5	16.9	31.8	386.7	268.9	388.3	487.8	54.7	77.5	34.8	25.7	1809.9
2013	13.9	17.6	46.1	23.3	242.5	216.7	305.9	541.4	374.3	61.2	69.6	22.3	1934.8
Avg.	25.8	13.2	42.2	41.4	232.5	256.4	347.0	342.4	205.5	83.8	27.5	22.2	1639.9

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013).

36. Humidity in this area is subjected to seasonal variations, the highest values are in February and March when they can reach 90%. The lowest humidity, from November to

January, is from 77% to 81%. The average moisture in the project area during the period from 2009 to 2013 is 79%. The average values of the monthly and yearly humidity during the period from 2009 to 2013 are shown in the Table 6.

Table 6. Average Relative Humidity in months (%)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Avg.
2009	77	88	86	86	86	80	84	84	83	82	71	78	82
2010	81	80	78	85	81	74	74	82	79	70	71	77	78
2011	71	83	81	80	76	80	78	81	81	79	77	68	78
2012	83	83	83	80	76	80	78	81	81	79	77	68	78
2013	82	86	80	81	80	74	83	81	82	73	73	68	79
Avg.	79	84	82	82	80	78	79	82	81	77	74	72	79

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013).

37. Rainfall in Thuong Tin District is 1600mm-1700 mm, concentrates mainly from June to September. The average air humidity is 82%.

c. *Wind direction*

38. Hanoi is located in the monsoon influenced area. In summer, south-easterly monsoon winds are prevailing with frequency from 41.5% to 57.5%, bringing cool and moist air from the Pacific Ocean. Prevailing in winter are northeast monsoon winds with the frequency 28.6% to 29.8%; dry in the early season and wet in the end. In winter South-eastern monsoon appears with frequency of 28.3%, creating a pleasant weather. In addition, Hanoi summer is also affected by hot dry west monsoon with lesser frequency. The northeast monsoon is the one with thunderstorms that can create a wind pressure of 95 daN/m^2 and wind speed can reach up to 40m/s. The wind direction in Thuong Tin District follows the same pattern as describe above.

d. Sunlight hours

39. The total number of average hours of sunlight measured in 5 years, from 2009 to 2013, is 1,191.2 hours/year. The sunlight regime is closely related to the radiation and cloud status. From December to April due to the cloudy weather, the number of sunshine hours is as few as 5 hours, and a monthly average of only 70.0 hours. From May the sunshine hours rise up to 131.7 hours/month. The duration of sunlight in year is shown in Table 7.

Table 7.Yearly and monthly sunlight hours from 2009 to 2013 (hrs.)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	96.8	0.0	45.2	97.6	143.6	168.3	161.9	202.4	139.8	126.4	141.4	67.1	1390.5
2010	32.8	93.6	50.7	48.3	130.8	159.2	180.1	120.8	145.0	102.3	103.1	78.6	1245.3
2011	3.7	38.5	15.2	56.0	141.2	126.1	149.9	150.1	102.4	72.6	104.6	95.0	1055.3
2012	4.5	21.0	23.8	88.7	146.2	106.9	142.2	159.2	109.6	98.2	92.2	40.4	1032.9
2013	12.2	38.2	74.3	69.4	156.3	158.7	118.8	139.0	92.8	140.1	76.0	156.3	1232.1
Avg.	30	38.3	41.8	72	143.6	143.8	150.6	154.3	117.9	107.9	103.5	87.5	1191.2

(Source: Hydro-meteorological Documentation Centre - National Hydro-meteorological Center, 2013 and Hanoi Statistical Yearbook, 2013).

40. The total number of average hours of sunlight in Thuong Tin District is 1741 hours, which is favourable for 3 crop production per year.

e. Thunderstorms

41. Located in a storm prone area, the subproject is directly affected by storms and

thunderstorms. Storm season lasts from June to September, with 1-2 storms per year of 12 level intensity and strong gales. During storms, wind speed may exceed level 12 (corresponding to 20-year cycle). The storm rainfall can reach from 100 to 500 mm, or 1000 mm at times.

42. Regarding thunderstorms, the number of thunderstorm days on average is about 51 days, i.e., an average of 219.1 hours. The average thunder density is 6.47; the peak month of thunderstorm is August. Thuong Tin District has 2-3 storms a year.

2. Air quality

43. The Tia substation is located suburban area (Thuong Tin District)., It is about 70 m far from province road No. 429 and surrounded by fish ponds and rice field on the West and South. Therefore, the air quality is still good. The monitoring results of Tia 110kV substation in June 2015 showed all analysed values for noise, total suspended particle (TSP), CO, SO_2 are met the allowable limits of QCVN 26:2010/BTNMT, QCVN 05:2013/BTNMT (Table 8).

Table 8: Analyzed results of air quality in the subproject site

No	Parameter	Unit	Result				QCVN 26:2010/BTNMT (6-21 hours)	QCVN 05:2013/BTNMT
			Kxq1	Kxq2	Kxq3	Kxq4		
1	Noise	dB	62.1	59.5	60.0	58.6	**70**	**-**
2	Total suspended particle (TSP)	mg/m^3	0.09	0.11	0.15	0.10		**0.3**
	CO	mg/m^3	0.21	0.23	0.20	0.25		**30**
4	SO_2	mg/m^3	0.07	0.08	0.09	0.06		**0.35**
5	NO_2	mg/m^3	0.04	0.05	0.07	0.05		**0.2**

(Source: Environmental monitoring report of Tia Substation, June 2015)

Note:

- *Kxq1:At the fence on Southeast direction bounded with Thuong Tin Electricity Company (N: $20^o48,200'$ E: $105^o52,993'$)*
- *Kxq2: At the fence on Northeast direction bounded with residential houses (N: $20^o48,193'$ E: $105^o52,975'$)*
- *Kxq3: At the fence on Northwest direction bounded with bare land of local residents (N: $20^o48,187'$ E: $105^o52,994'$)*
- *Kxq1: At the fence on Southwest direction bounded with residential houses (N: $20^o48,201'$ E: $105^o52,968'$)QCVN 05:2013/BTNMT: National technical regulations on ambient air quality*

3. Topography, Geography and Soil

a. Topography

44. The majority of the Ha Noi area is located in the Red River delta with an average elevation of 15m to 20m above sea level. The hilly areas are in the north and northwest of Soc Son district of the southern edge of Tam Dao Mountains with elevations from 20m to over 400m. The highest peak is Chan Chim peak at 462 m. The topography of Ha Noi decreases from north to south and from west to east. The main topographic form is the enriched alluvial river plain with high alluvial terraces interspersed with low lying lakes. Thuong Tin has a large area of flat land, low altitude between regions are insignificant difference. Terrain gradually slopes from North to South from East to West.

45. Tia 110kV Tia substation is located within Tu Duong village, To Hieu commune, Thuong Tin district, Hanoi. To Hieu commune is located next to Thong Nhat railway, new and old 1A highway (Phap Van - Cau Gie highway) (the old 1A highway and the North- South railway cross the commune, the new 1A highway is running along the edge of the commune on the East. In the middle of the commune is Tia station, Thong Nhat railway station.

46. The commune topography is flat terrain constituted by rice field and fish pond. So, this

topography is younger formations with river sediments. The area stratigraphy is complex change, with the thick weak soil layer.

b. Geography

47. According to the geological survey in the subproject area, and to the laboratory results the geological composition of the soil layers within the survey depth, the two soil layers are described as follows:

Layer 1:

- Bluish-blackish gray sandy clay, this layer lies on top, appears at both drilled holes, depths vary from 1.2m to 1.6m
- At this layer, 02 samples were taken. Through conducted experiments have identified the physico-mechanical characteristics of soil as described in the following Table 9:

Table 9. The physio-mechanical characteristics of soil

No.	Physio-mechanical characteristics	Symbol	Unit	Value
1	Particle composition <0.005mm	P	%	
2	Density	ρ	g/cm^3	2.68
3	Natural moisture	W	%	55.7
4	Bulk density	γo	g/cm^3	1.55
5	Dry bulk density	γc	g/cm^3	1.00
6	Melting limit	W_L	%	52.9
7	Plastic limit	W_P	%	39.0
8	Plasticity index	I_P	%	13.9
9	Dense	B		1.20
10	Saturation	G	%	88.1
11	porosities	n	%	62.9
12	Pore Coefficient	εo	-	1.694
13	Friction angle	φ	Degree	$5^0 23'$
14	Adhesive force	C	kg/cm^2	0.08
15	Subsidence compression ratio	a	cm^2/kg	0.062
16	Total distortion module	E	kg/cm^2	26.9
17	Load capacity convention	R	kg/cm^2	0.51

Layer 2: Layer 2 is affine grained sand layer, bluish grey, water-saturated state, spongy texture. This layer appears at both drilled holes, depths vary from 1.2m to 1.6m, depth end undetermined. At this layer, 04 samples were taken. Through conducted experiments, the physio-mechanical characteristics of soil have been identified and described in Table 10:

Table 10. The physio- mechanical characteristics

No.	Physio- mechanical characteristics	Symbol	Unit	Average value
1	Particle composition			
2	2.0-0.5		%	
3	0.5-0.25		%	
4	0.25-0.10		%	
5	0.10-0.05		%	
6	Density	Δ	g/cm^3	2.64
7	Angle of repose when dry	$\dot{o}_c$	degree	$26^0 12'$
8	Angle of repose when wet	$\dot{o}_w$	degree	$22^0 04'$
9	Smallest pore Coefficient	e_{min}	-	0.741
10	Highest Pore Coefficient	e_{max}	-	1.033
11	Total distortion module	E	kg/cm^2	31.5
12	Load capacity convention	R	kg/cm^2	0.8

c. Soil Environment

48. Most of surface area of the Red River Delta (RRD), which includes Ha Noi, is covered with sediment formation. The youngest formation around 3,000 years of age is mainly was originally composed of lacustrine and shallow-sea sediment. In Ha Noi area the highest thickness reaches around 30 m and dominated by soft soils. Ha Noi has 18 major soil types including 36,769 ha of alluvial soil accounting for 56%, 16,819 ha of degraded land accounting for 26%, with the remaining 12,019 ha accounting for 18%.

49. Soil types in Thuong Tin district include the following:

- According the land use plan, the total land area of Thuong Tin District is about 12,738.64ha, which consists of: Urban Land area (Thuong Tin Town, part of the urban subdivision S5, GS, GS (A), the Red River and part of Phu Xuyen satellite towns) around 3,599.09ha and rural land area of about 9,139.55 ha.
- Thuong Tin District land has been formed by alluvial soils of the Red River, that are divided into 5 main categories:
    - White sandy soil: an area of 122.22 ha, accounting for 0.96% of the natural area of the district and 1.45% of possible agricultural land; mainly distributed in Tu Nhien commune.
    - Neutral Alluvial soil: 171.67 ha area occupied 1.34% of natural land and 2.03% of possible agricultural land. Land distribution in communes outside the dike area such as Tu Nhien, Ninh So, Thong Nhat, Hong Van, Chuong Duong, Le Loi, Van Diem.
    - Acid Alluvial soil: 6,059.48 ha area; accounting for 47.45% of the natural land and 71.7% of possible agricultural land. This land distribution mainly inside the dike, on all communes in the district.
    - Gley neutral alluvial soil: 1,711.06 ha area includes 14.3% of the natural land and 20.21% of the possible agricultural land. This land distribution inside the dike, with most of the communes as Ninh So, Duyen Thai, Tan Minh, Nhi Khe...
    - Gley acid alluvial soil covers an area of 386.92 ha; 3.03% of the natural land area and 4.58% possible agriculture land. This land distribution inside the dike, at Dung Tien, Thang Loi, Tien Phong, Tan Minh, and Khanh Ha communes.

4. Surface water/groundwater resources

a. Surface wate

50. There are two major rivers the Red River and Nhue River flowing through the district. Red River is located in the eastern boundary runs between Thuong Tin district and Hung Yen. Nhue River in the West, as well as water supply and drainage is important for agriculture (production).

51. Surface water is used in the district mainly from the Red River through Hong Van irrigation pumping stations. Red River water with high silt content, good quality can make rice fields more fertile. Nhue River is both a source of important irrigation water also a major source of the drainage for the district. There are also small rivers like Lich River, Hoa Binh River on the area

b. Groundwater resources

52. Reports on water quality in Hanoi presented that groundwater resources are being depleted and polluted. Ground water is exploited through a system of more than 170,000 wells, for extraction of 700,000 m^3 per day. The Center for Water resource Monitoring and forecast (under MONRE) also confirms that the depth of the water table in Hanoi is increasing. By 2020, the extraction is expected to reach 1.4 millionm^3 per day. Based on geological and hydrological surveys in the subproject area, groundwater levels are relatively stable in the boreholes, changing from 4.4m to 4.5m. Surface water and groundwater are subject to seasonal fluctuations.

53. In Thuong Tin district, underground water at a depth of 15-25m can be exploited and used for the purposes of production and living.

5. Water quality

a. Surface water quality

54. Surface water sources (fish ponds) in the substation area had expressed a sign of pollution due to receiving wastewater from surrounding residential areas. To examine the quality of surface water in the area of the substation, a surface water sample in the drainage ditch running through the substation area was sampled and analyzed. The results from survey showed that almost all parameters of the surface water source meet the standard with the exception of BOD_5, COD N-NH 4 +, N-NO2 - which exceed the standard level (Table 11). This indicates the water is polluted by organic matter from domestic wastewater discharged from residential area surrounding the substation

Table 11: The analyzed results of surface water quality in the subproject area in 2012

No.	Parameter	Unit	Result	QCVN 08:2008 / BTNMT (column B2)
1	pH		7.7	**5,5-9**
2	BOD_5 (20 ^{o} C)	mg / l	57	**25**
3	COD	mg / l	88	**50**
4	TSS	mg / l	89	**100**
5	As	mg / l	<0.005	**0.1**
6	Cd	mg / l	<0.001	**0.01**
7	Pb	mg / l	<0.0002	**1**
8	Zn	mg / l	<0.0005	**2**
9	Mn	mg / l	<0.1	**-**
10	Fe	mg / l	0.9	**2**
11	$N\text{-}NH_4^+$	mg / l	1.4	**1**
12	$N\text{-}NO_2^-$	mg / l	0.12	**0.05**
13	Cyanide	mg / l	0.01	**0.02**
14	DO	mg / l	3.3	**>=2**
15	Hg	mg / l	<0.0002	**0.05**
16	Cr(VI)	mg / l	<0.02	**1**
17	Cr(III)	mg / l	<0.02	**0.5**
18	*Grease and Oil*	(MPN/100ml)	0.2	**0.5**
19	T- *Coliform*	(MPN/100ml)	7600	**10000**

(Source: Environnemental Protection report on Tia Substation , 2012)

- *QCVN 08: 2008/BTNMT national technical regulation on surface water quality. This was replaced by 08: 2015/BTNMT from December 2015.*
- *Column B2: water quality for irrigation and transportation purposes*

Sampling location: drainage ditch running through the substation area

b. Wastewater quality

55. The wastewater quality of the substation is measured from sample taken at the last discharged point of the substation to the surrounding water bodies. The analyzed results showed that after preliminary treatment by septic tank and sediment trap chamber the wastewater of Tia substation has almost met the QCVN 14:2008 standards, except TSS that exceeds C_{max}1.3 times. This may cause by sediment in the sewage or dust/soil particles in rainwater run-off (Table 12)

Table 12: The analyzed results of wastewater quality in the subproject area

No.	Parameter	Unit	Result	QCVN 14:2008 / BTNMT (column B)	
				C	C_{max}
1	pH		8	**5 - 9**	**5 - 9**
2	TSS	mg / l	155	**100**	**120**
3	TDS	mg / l	1124	**1000**	**1200**
4	BOD $_5$ (20 ^{o} C)	mg / l	8	**50**	**60**
5	N-NH_4^+	mg / l	12	**10**	**12**
6	N-NO_3^-	mg / l	<0.1	**50**	**60**
7	Grease and oil	mg / l	2.5	**20**	**24**
8	Surface active substance	mg / l	2.4	**10**	**12**
9	P-PO_4^{3-}	mg / l	11	**10**	**12**
10	H_2S	mg / l	<0.05	**4.4**	**4.8**
11	T- *Coliform*	(MPN/100ml)	4.100	**5000**	**5000**

(Source: Environmental monitoring report of Tia Substation, December 2015)

QCVN 14: 2008/BTNMT national technical regulation on domestic wastewater

- *Column B specifies C value of pollution parameters as a basis for calculating the permissible maximum value in domestic wastewater as being discharged into water resources not used for the purpose of domestic water supply*
- *C_{max} is the permissible maximum concentration of pollution parameters in domestic wastewater as being discharged into the receiving water resource*
- *K=1.2 is a coefficient taking into account the size and type of services facilities, public facilities and condominium under500 persons*

Sampling location: last discharged point of the substation to the surrounding water bodies

Groundwater quality

56. The ground water quality after preliminary filtration, which is used as clean water for daily use at the substation, is presented in Table 13. It can be seen that all parameters of groundwater used as clean water source meet allowable limits of QCVN 01:2009/ BYT for drinking water.

Table 13.Groundwater quality used as clean water source

No.	Parameter	Unit	Results	QCVN 01:2009/ BYT
1	pH	mg / l	7.0	**6.5 – 8.5**
2	Turbidity	NTU	1.0	**2**
3	TDS	mg / l	520	**1000**
4	N-NO_2^-	mg / l	0.08	**3.0**
5	N-NO_3^-	mg / l	1.24	**50.0**
6	SO_4^{2-}	mg / l	14	**250**
7	H_2S	mg / l	<0.002	**0.05**
8	As	mg / l	0.005	**0.01**
9	Hg	mg / l	0.0002	**0.001**
10	NH_4^+	mg / l	0.32	**3.0**
11	T-Fe	mg / l	0.2	**0.3**
12	T- *Coliform*	(MPN/100ml)	8	**0**
13	*T-Ecoli*	(MPN/100ml)	0	**0**

(Source: Environmental monitoring report of Tia Substation, December 2015)

QCVN 01:2009/ BYT: National Technical standards for drinking water

A. Biological Environment

1. Vegetation and Land Use

57. **Vegetation**. There are 23,510 ha of forest land in Hanoi (including 16,770 ha of former Ha Tay Province), accounting for 6.9% of total natural land area; including 3,922 hectare of natural forests and 19,568 ha of forest plantations. Some nature reserves exist in the area such as Ba Vi National Park, Huong Pagoda, Forest in My Duc District. Forest in Hanoi is an important resource to maintain the ecological balance, prevent soil erosion and facilitate tourism and relaxation activities. The subproject is to be implemented on the terrain of mainly fish pond and agricultural land, in rural area. The ecosystem is poor, characterized by the rural landscape without any valuable, rare or endangered species.

58. Terrestrial ecosystem includes terrestrial flora, which consists of mainly artificial vegetation: rice, tea plant, vegetables, fruits, shrub gardens. Fauna: there are no endangered animals, mostly livestock animals such as cattle, pigs, chickens, dogs, cats, etc.; natural fauna include some reptiles, rodents, birds, bats, rats, hamsters, frogs etc.

59. Aquatic ecosystem in rivers and lakes in the subproject area include phytoplankton, algae such as diatoms, green algae, duckweed. Also in aquatic ecosystems are submerged trees, phragmites, and shrubs around the banks... Aquatic species include fish, shrimp, crabs, snails etc. Zooplankton includes thyroid groups, zoo benthic crabs, snails, clams group as mussels... bivalve mollusks, gastropods, mollusks, crustaceans, shellfish, aquatic insects, fish...

60. ***Land use:*** The land area for different land use patent in Thuong Tin District is presented in Table 14

Table 14: Table comparing the land use structures in 2010:

No.	Land types	Area (ha)	Structure (%)
	The total area of natural land	**12 729.30**	**100.00**
1	***Agricultural land***	***6 461.91***	***50.76***
1.1	Agricultural production land	5 709.53	44.85
1.1.1	Annual crop land	5 416.68	42.55
1.1.2	Perennial crop land	292.85	2.30
1.2	Forestry land		
1.3	Aquaculture land	729.29	5.73
1.4	Other agricultural land	23.09	0.18
2	***Non-agricultural land***	***6 029.14***	***47.36***
2.1	Residential land	1 644.70	12.92
2.2	Specialized land	3 363.42	26.42
2.2.1	Institution, construction land	64.29	0.51
2.2.2	Defense, Security land	55.69	0.44
2.2.3	Production and business land, non- agricultural	1 554.01	12.21
2.2.4	Land for public purposes	1 689.43	13.27
2.3	Land for religionsbeliefs	90.70	0.71
2.4	Land for cemeteries and graveyards	169.61	1.33
2.5	River, lake, pond land	742.87	5.84
2.6	Other non-agricultural land	17.84	0.14
3	Unused land	238.25	1.87
3.1	Unused flat land	238.25	1.87

(Source: Report of an overall explanation of LUP 2001 - 2010 and the land use plan 2006 - 2010, Thuong Tin District - Ha Tay)

61. Total land area acquired permanently by the subproject is 4,060.92 m^2, including 124.4m^2private agricultural land and 3,936.42 m^2 public land (aquaculture land).

2. Wildlife

62. No significant wildlife occurs any longer within the area. There are no animals that could interfere with or have impact on the subproject site.

3. Conservation areas

63. There are no conservation areas within the proximity of the subproject site.

B. Socio-economic conditions

1. Population

64. Thuong Tin is the suburban districts of Hanoi capital, covers an area of 127.59 km^2, with 28 communes and 01 towns and a population of approximately 240,000 people. Thuong Tin is bounded by Thanh Tri district to the North, Phu Xuyen district to the South; Khoai Chau district to the East, Hung Yen province and Thanh Oai district to the West.The forecast maximum population of Thuong Tin district is about 287 thousand in 2030, of which the urban population of about 117 thousand people; rural population of about 170 thousand people.

65. The subproject site situates in Tu Duong village – To Hieu commune -Thuong Tin District. To Hieu commune has a total area of 6096ha and a population of 62567 people. The average density is 10.24 people/ha. The rate of natural population growth of 1.1%. The sex ratio at birth of 113 boys/100 girls. Currently the number of poor households is 68 households. No ethnic minority group lives in this commune

2. Local Economy

66. In Hanoi, the average economic growth rate in period 2011-2015 reached 12-13%/year; from 2016 to 2020 may reach about 11-12% and from 2021 to 2030 about 9.5 to 10%. In 2015, per capita GDP of Hanoi is 4100-4300 USD; by 2020 is about 7100-7500 USD, by 2030 to reach 16,000 - 17,000 USD (in actual price).

67. In 2015, the economic structure is as follows: services accounting for 54-55%, industry - construction accounts for 41-42% and agriculture 3-4%. In 2020, the service sector will account for 55.5 to 56.6%, industry - construction accounting for 41-42% and agriculture 2 - 2.5%. The growth rate of export value in Ha Noi averaged 14-15%/year over the period 2011 to 2015 and 13-14% in the period 2016-2020.

68. To Hieu commune:

Agriculture: from the total average yield 195,5kg/360$m^2$the yield of rice at present reaches55.0 kg/360m^2.An area growing rice is296.64ha, reaching 97 % of the plan. There are 2.448 ha specialized in perenial crop and 59.76 haof aquacultural land, reaching 97 % of the plan.

Commerce - Services: As this area has trading with Hanoi city, it is very favorable for development of trade and services. According to a survey in 2015, the commune has 1,182 households with commercial service activities that include 553 traders, 54 transporters, 243 food services, 06 information technology services and 72 other services. Income from trading services was estimated at 63.2 billion.

Industry - handicraft: The area has many industrial sectors, such as handicrafts processing of agricultural and forestry products, embroidery, carpentry, carving stations, mosaic, construction, contributed to employment, increase incomes for workers, according to a survey in 2015, in the local commune area there are 264 households working in industry sector, handicraft with estimated income of 55 billion.

3. Social Infrastructure

a. Public Health and Sanitation

69. The subproject site is located in a distance of 20 km from the central area of Hanoi that means, good access to social services from local to central level is secured. The local health facilities include health center at commune level, first aid and medical assistance for minor illnesses and health care services for mothers and children, such as immunization, pregnancy

care, family planning, etc... At upper levels there are hospitals at municipal and central level, in addition to a broader system of private clinics and hospitals of high quality and expertise.

70. To Hieu commune has 98% of households using water from drilled wells, 82% of households having septic tanks, and 78% of households installing rainwater tanks. There are 218 households obtain clean water by water purifiers to ensure service standards for 1056 inhabitants.

b. Education

71. Thuong Tin district has relatively a well-developed educational infrastructure. In addition, to public schools at all levels from pre-school to high school, this area possesses colleges and universities such as Pedagogical College, Telecommunication College. and private educational institutions.

72. To Hieu commune has all school levels: kindergarten, elementary school, junior high school. 100% of school age-children go to school. Total number of pupils of 3 schools is 2,339 in which pupils from kindergarten are 785 children, from elementary school are 902 children, from secondary school are 652 pupils

c. Communications

73. The subproject area is covered by post station; many telephone networks as Viettel and VNPT telecommunications, and a number of other telecommunications companies. Internet services are very common and convenient in the area.

d. Water supply, electricity and transport

74. Water supply: In To Hieu commune 98% households using well water, 78 % of households to install rainwater tanks. There are 218 households with access to clean water by water purification equipment to ensure service standards for 1056 inhabitants. No water supply treatment factory is in the commune yet.

75. Drainage: In Hanoi suburban areas, including the subproject area, the drainage system in general has not been completed; it is used for both sewage and storm water which are then discharged to the rivers and caused water pollution. The rivers in the subproject area including Tich River, Hong River...

76. Power supply: Ha Noi currently has 7 electric stations and 200kV and 500kV lines, 23 10-kV electric downloading stations. Levels of 35, 10, and 6kV are gradually shrunken, and levels of 22kV/ 0.4kV are retained. A 22kV line in urban and neighboring areas is designed.

77. Transport: Thuong Tin District has favorable road system with two national roads running along the district, that are 17.2km long 1A highway and 17km Phap Van - Cau Gie highway to Van Diem Bridge junctions with 429 road (ex 73). Two provincial roads running across the district include the 427 provincial road (ex 71 road) from the Van La steep (Hong Van commune) through overpass Khe Hoi to the Thuong Tin town to west of district and the 429 province road (ex 73) from the Phu Minh town (Phu Xuyen district) pass under the Van Diem overpass to Do Xa T-junction which intersects with Highway 1A; followed by 429 road from the Tia T-junction to Dong Quan. A bridge connecting Me So to Van Giang district, Hung Yen province is expected to build.

78. There is north-south railway on the district runs through 3 stations which are Thuong Tin station, Tia station and Do Xa station. Waterway has Red River, Hong Van port and Van Diem port. Cross the river to Tu Dan, Khoai Chau, Pho Noi and Hung Yen City

4. Culture and heritage

79. Thuong Tin District has many culture and heritage infrastructure such as: Quan Van Stone tomb atVan Tao Commune. Dau Pagoda, also known as Self- Enlightenment pagoda, the Phap Vu Tu, King Temple, Ba Temple is located in the village of Gia Phuc, Nguyen Trai Commune. The pagoda was built from the third century, major construction in the Ly dynasty and renovated in the Le dynasty (XVII - XVIII) according to the Four dharma system structure of Buddhism.

80. The district has 126 ancient villages, currently divided into 169 villages, residential areas and population groups belonged to28 communes and one town. Inherited unique cultural history traditions of urban neighborhoods. The district has many archaeological sites of the Neolithic, the period of the Dong Son culture.

81. In To Hieu commune are some public places of local communities as communal houses, pagodas, and offices, schools that are considered sensitive receptors. However, the substation is to be expanded on agricultural and aquaculture land, there are no cultural sites and heritages surrounding the substation area. It is confirmed that the subproject implementation will not have any impact on these sites. The sensitive receptors around the subproject site are presented in Table 15:

Table 15. Sensitive receptors surveyed around the subproject site

No	Sites	Distance to the project
1	Crowded residential area along road 429	70 m
2	To Hieu CPC office	300m
3	To Hieu primary school office	300m
4	To Hieu Secondary School	500m
5	Mui pagoda in To Hieu commune	1000m

(*Source: IEE consultant survey, 2016*).

4. UXO Clearance

82. After decades of war, the UXO is considered as significant issue in Vietnam, as well as in Hanoi. To identify the need to conduct UXO removal requirement, HANOI DPMB has sent the official letter dated 31 March 2016 to Hanoi Capital City Commander regarding the need of UXO clearance. Then, Hanoi Capital Commander has replied by the official letter No. 1026/MTM-CoB dated 20June 2016 to confirm the requirements of UXO clearance (Appendix D).

5. Subproject affected people

83. According to the resettlement survey results in 2015, there are only 8 households directly affected by the land acquisition, in which 2 households are affected by loss of private agricultural land and 6 households are affected by loss of aquaculture land. This aquaculture land is public land, which belongs to To Hieu people committee.

6. Land acquisition

a. Permanent land acquisition

84. Total land area acquired permanently to construct the tower foundations is 4.060,92 m^2 including 124.5 m^2 agricultural land of 2 households and 3936.42 m^2 of public land (aquaculture land) which under administration by the CPC of To Hieu commune.

85. The detailed impact of permanent land acquisition and detail impact on land managed by the CPC are presented in Table 16 and 17

Table 16.Detailed impact of permanent land acquisition of affected households

District / commune	Total affected area (m^2)	Residential land (m^2)	Perennial crop area (m^2)
To Hieu commune	124,5	0	124,5
Total	**124,5**	**0**	**124,5**

(Source: RP, 2016)

Table 17. Detailed impact on land managed by the CPC

Commune	Affected public land (m^2)	Area (m^2)
To Hieu	Aquaculture land	3,446.82
	Transportation and irrigation land	489.6
Total		**3,936.42**

(Source: RP, 2016)

b. Temporarilyland acquisition

86. Only small area of land is temporarily acquired for construction of worker camps outside the substation area. This is short-term acquisition. It will be returned when construction work finished

7. Additional Features of the substation

87. Tia substation is located near road 429 (with distance of 70 m). There are many shops and residential houses along this road. It is bounded by Thuong Tin Power Company dormitories to the North, bounded by Thuong Tin Power Company to the East, bounded by fish pond to the West and bounded fishpond and rice field to the South. Under this scheme, Tia 110kV substation will be expanded the area to the west and south under the existing premises. The extension area of 4039m^2mainly consists of ponds, only a small portion of rice fields, which is very convenient for expanding the area of the substation (Figure 3).

Crowded residential area along road No. 429

Short road section from road 429 to the substation gate

Entrance gate faced North direction

Road from Gate going West direction

	
Extended area on the West	Fish pond on the West
	
Fish pond at the South direction	Rice field the South direction

Figure 3: Existing environment in the subproject site

VI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

88. Assessment of potential impacts of the subproject is structured by the three development phases of the subproject: pre-construction, construction, and operational phase. The subproject's items including: Station's land use will be expanded toward the front of station (West) 16m x111.5m and to the right (south) 35.3mx59m which is enough to renovate and build 06 new 110 kV outgoing bays according to 2 bus bars map with contact breaker.

89. Potential impacts of common activities of the three phases can be addressed together to minimize impacts. Specific potential impacts to the subproject components will be discussed separately. This structure is used to establish the environmental management plan (EMP) that will be prepared for the subproject (Section VIII).

A. Subproject's benefits

90. The highest benefit of the subproject is to provide a necessary electricity to current and future load of Thuong Tin district – Hanoi city, provide stably electricity for the electric system in the West of Hanoi City in order to support the urban, commercial, and industrial rapid development that is occurring. The additional electricity will significantly reduce power outage or brownout that occurs in the area.

B. Potential Impacts and Mitigation Measures during Pre-construction phase

a. Land acquisition and compensation:

91. Impacts: In the basic design stage, total area of permanently acquired land for constructing the expanded substation is 4,060.92m2. Acquired land area consists of 124.5m2private paddy land of 2 households and 3,936.42m2 public land of To Hieu commune People Committee (489.6m2 transportation and irrigation land and 3.446,82m2 aquaculture land).No resettlement of any household and no impact on houses and structure are occurred. However, land acquisition could be impacts on livelihood and create economic burden for 2 households, which need to be considered in the resettlement plan of subproject. The summary of land acquisition is presented in Table 18. The details of the land losses and compensation are found in the Resettlement Plan (RP) which is under separate volume.

Table 18 Summary of land acquisition impact

#	Land	Households	Unit	Amount
I	***Permanently acquired***	***2***	m^2	***124,5***
1	Agriculture land	2	m^2	124,5
II	**House and structures**	**12**	m^2	**228,25**
1	Fibro cement roof temporary house	1	m^2	15,86
2	Brick courtyard	2	m^2	23,79
3	Wall	2	m^2	81,25
4	Iron frame Fences	1	m^2	16,50
5	Wall basement	1	m^2	42,75
6	Corrugated iron roof	2	m^2	26,90
7	Underground water tanks	1	m^3	9,60
8	Sump	1	m^3	9,60
9	Filter-bed	1	m^3	2,00
III	**Trees**	**10**	tree	**101**
2	Fruits	6	tree	94
3	Timber trees	2	tree	3
4	Landscape trees	2	tree	4

#	Land	Households	Unit	Amount
IV	**Public construction**	**0**	m^2	**3.936,4**
1	Aquaculture land	0	m^2	3.446,82
2	Irrigation canal land	0	m^2	489,6

Source: Tia substation RP, 2016

92. Mitigation measures

- Affected persons are informed ahead on the subproject implementation and participated in acquisition and inventory of land, consulted in compensation assistance
- Compensation and resettlement activities need to:
    - Comply with the regulations of the Land Law No 45/2013/QH13 dated November 29,2013and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Hanoi People's Committee
    - Comply with the regulations of the Electricity Law and the Decree No. 14/2014/ND-CP and relevant regulations on safety land area surrounding the substation.
    - Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations by strictly compliance with approved updated resettlement plan of Tia subproject.

-

b. UXO clearance

93. Impacts: According to the confirmation letter of the Hanoi Capital Commander No. 1026/MTM-CoB dated 20 June 2016, the UXO need to conduct for an expanded area of the subproject area. It is mean that UXO may remain in the subproject areas, which may create high risks of safety, accident for local people and workers during construction phase. Although the possibility of finding unexploded ordnance is low, its consequences, if explosion occur, causing to detectors and local people are high, since subproject is close to several households and Thuong Tin EVN office, commercial shops. Therefore the UXO clearance will be implemented right before the construction starts to reduce risks during construction phase.

94. Mitigation measures: The proposed guidance for UXO clearance is as follows:

- Engage an authorized UXO clearing contractor, execution of demining and UXO is done following these steps:
    + Covering UXO detection and clearance area,
    + Clearing the grounds
    + Detection by the detector to a depth of 0.3m
    + Mark, digging test and resolve signal to a depth of 0.3m
    + Detect bomb by detector to a depth of 5m (put in step with high sensitivity)
    + Excavation, checked resolve signal to a depth of 3m
    + Excavation, checked resolve signal to a depth of 5m

Note: before detecting UXO under wet fields, marshes pond with a depth <0.5 m, it is must to embankment and drain water to avoid remaining tidy UXO. When detecting UXO on terrestrial land, warning boards and guard have to be arranged to avoid accidents due to entrance of people, animals or vehicles.

- Collecting, sorting, transportation management and destruction of mines and explosives are under strict safety standards for preservation, transport and use of explosives inQCVN 02:2008/BCT on National technical regulation on safety in the storage, transportation, use and disposal of industrial explosive materials, and the other current regulations.

- Competent unit shall be responsible to notify the military commander in the Hanoi city (Capital city commander) on the implementation mission: clearance location, construction schedules and staying time in the locality.

- Ensure that the contractors shall only commence site works after the UXO clearing agency has certified that the project areas are already been cleared.

B. Potential Impacts and Mitigation Measures during Construction phase

1. Potential impacts and mitigation measures for construction activities

95. Potential environmental impacts and mitigation measures of the subproject activities during the construction phase on the different environmental aspects are described as bellows:

a) Ambient air quality and noise

96. Impacts: Dust and exhaust emission gases generated from construction equipment/machines, trucks operation and excavation and leveling activities and equipment installation could be identified that the main sources from the construction activities. However, the dust generated during construction of expanded parts of Tia SS is very limmited due to small volume of excavated and levelling soil, and excavated soil is mostly wet (fish ponds) soil which could help to minimize dust release from these activities. Moreover, construction activities will be mostly implemented in area of existing Tia substation and at open space, which is adjecent to fish pond and rice field, only several housedholds located close to consturction site and along the access road (from road 425 to construction site) whose could be affected . Other exhausts such as NOx, SO_2, CO will be also very limited due to very few equipment and machines being mobilised on the sites. And as reported in Section V, concentration of air pollutants are still within allowed values, thus subproject activities will not cause significant change in ambient air quality.

97. Noise will be generated by activities of machines, equipment and means such as truck, bulldozer, excavator, concrete mixers etc and most of machines will generated noise higher than than the allowable limit (70dB). Therefore, agencies (Thuong Tin ENV office and Tia station office) and household closes to construction site and along the access road could be affected due to noise from construction and transportation activities. Appropriare mitigation measures need to apply to minimize the impacts .

98. Mitigation measures:

- Water need to be sprayed at the construction sites, access road from road 429 to construction site when dust is visible (road 429 and access road to the existing substation) to minimize dust.
- All vehicles used for construction, and equipment and machines emitting noise, exhausts need to be maintained properly to minimize emission,
- Equipment and truck will not allow to be operated at night in the construction sites and access road to minimize noise.
- Contractors will ensure that transportation means, machines and equipment must have effective certificate of environmental standards achievement(QCVN 04: 2009/BGTVT and QCVN 05: 2009/BGTVT) issued by the register department before using for the subproject construction.
- Construction materials (e.g., sand, gravel, and stone) that are transported by trucks will be covered by canvas and all trucks used should have well fitted bodies and not be overtopped in loading to avoid soil scattering.
- Temporary stockpiles/storage yards located inside the existing substation will be covered, and located away (50m) from household and Tia substation, Thuong Tin ENV offices.
- Soil scattered on the paved road and public road shall be removed immediately

- Schedule to ensure that excavation and filling work will be conducted section by section and reduce excavated soil to fill fish pond right after completion of excavation work to reduce dust emission
- Operate equipment, machines and vehicles causing large noise only at daytime.
- Drivers will be requested not to make horn and to turn of the truck engine when the truck stops for long time at the clouded residential area to reduce noise and gas emission.

b) Water environment:

99. Impacts: The water pollution sources from subproject activities could be listed as i) discharged wastewater from workers' camps; and ii) wastewater from maintenance activities of construction machinery and (iii) inappropriate solid waste management.

- *Domestic wastewater*. About 30 workers will be mobilized in Tia Substation it is estimated that the daily wastewater volume generated in the construction site will be about 2.4 m^3[1] which may cause affect to surrounding water bodies;
- *Construction wastewater* is mainly runoff water and wastewater from concrete mixing activities. This kind of wastewater contains high concentration of suspend solid. However, demand of concrete on the site is quite few and only small capacity of concreate mixing machines (80L and 250L) will be shortly mobilized at the site thus wastewater generate from this activities could be considered as very minor.
- *Hazardous waste* included spent oil, lubricant and grease, oily rags, grease, lubricant from machines, equipment and transportation vehicles, which could cause potential pollution of surface water source if they are not collected and treated properly. However, this type of waste will be very limited since few number of equipment will be mobilized on the site. The construction site will be located within the existing Tia substation.
- *Domestic and construction solid waste* if they are not properly collected it may cause water pollution of surrounding water bodies. It is estimated that about 15 kg/day of domestic water will be generated daily which includes organic matter, pathogenic bacteria/viruses. About 677m^3 of excavated slude will be generated on the site which need to be properly managed to reduce impacts on water quality.
- *Construction material*: as proposed the subproject will required 9,805.8m^3 of sand and soil for levling, these material are planed to be purchased from existing mine/borrow pits which environmental management belong to suppliers, however, exploitation of sand will cause many impacts on environment, which need to be monitored during construction site.

100. However, the impacts is considered as minor due to: i) the worker camps will be located inside the existing substation area, iii) the closest water bodies (fish ponds) will be filled up for substation foundation and water in the fish pond will be withdrawn during construction phase, iii) no irrigation canals are close to construction; iv) very small number of equipment will be mobilized on the site and v) the excavation works will be taken place in dry season from November or December, (dry season in the Hanoi is from November to April) which could help to reduce impacts from runoff water and vi) excavated sludge will be controlled through economic contractor with Thuong Tin URENCO. Moreover, existing drainage system is available around construction site which could be used to collect this type of waste water.

101. Mitigation measures:

* For domestic wastewater:

- Provide sanitation mobile toilets with septic tanks to locate at the workers' camps and hire competent unit, which is Thuong Tin urban Environment Company to collect toilet waste periodically.
- Provide 2 mobility septic tanks on the sites to primary treat domestic wastewater then

[1]Refer to standard in TCXDVN 33:2006

provide connection with general existing drainage or domestic wastewater collection system in the areas to discharge domestic waste from worker camps and pay wastewater treatment fee for relevant agencies. The wastewater treatment of Thuong Tin district is under constructed, thus most sewer system in Thuong Tin will be discharged to Nhue river then run to Yen So detention pond

- Priority to hire local workers to work on the site, who will be return to their home after work

* For construction wastewater:

- Schedule excavation activities during dry season to reduce volume of runoff water, the dry season in the Hanoi is from November to April
- Waste water will not be allowed to discharged to surrounding areas through strictly supervision of compliance performance of contractors;
- Construct construction wastewater collection holes for depositing suspended solid and provide a connection pile section to utilize the existing drainage system in the subproject areas for discharging this type of wastewater.
- Location of material storage areas on the site will need to keep distance from water bodies and cover during rainy time;
- The placement of washing instruments/vehicles next to the water bodies, canals (identified in Water quality impact section) will not allowed;

* Solid waste management

- For domestic waste: Store domestic solid waste in a dust bins then hire the Thuong Tin urban environmental company to collect and dispose in regulated landfill site
- For construction solid waste: Reuse/recycle as much as possible construction solid waste such as empty cement sacks, wooden barrel, plastic, foam, cardboard boxes etc. The things that cannot be reused, disposed properly to avoid falling to the water bodies.
- Excavated sludge will be collected and transported to fill pond in Nam Dinh village, To Hieu commune. The pond is managed by CPC and the CPC wants to use sludge to fill the pond. Currently, procedures for agreement of waste disposal are being completed by the PMU. The procedures will be completed prior to construction. The distance from Tia Substation to the waste disposal site is about 1.5 km.

* Sand and soil exploitation:

- Sand volume for pond filling is about 9,805.8 $m^{3,}$ which will be purchased from local providers with have DONRE authorized, the contractors need to be check operation license of providers ;
- Extraction of sand in river beds shall be prohibited except: (i) where this is no technically and economically feasible alternatives and (ii) provided specific mitigation measures are implemented to minimize impact on river morphology, water quality (e.g., turbidity) and aquatic ecosystems (e.g., reduced extraction during fish spawning period);
- Monitoring the implementation of environmental protection measures at the soil pit and sand mines done by suppliers.

c) Soil environment:

102. Impacts: Soil quality of surrounding rice field in Tu Duong village could be affected by construction activities. The main impacts could be listed as scattered raw material/excavated soils, deal concrete and spill of oil/fuel into the surrounding area and discarded waste water without any pre-treatment as well as dumping the solid waste in the agricultural land. The construction activates could lead to increase content of heavy matters, organic matters, bacteria/viruses, oil, grease and other hazardous substances. The results could be reduce soft level of soil, prevent water adsorption, high content of metals and hazardous substances may effect to growth of plant and soil aminal. However, the impact will be quite minor due to: i) very

limite of domestic waste will be generated (15 kg/day); ii) the construction activities will not involve much in hazardous substance; iii) construction site is keep distance from agricultural areas (from 30 to 50m) and most activities will be implemented within ROW of subproject; iii) almost excavated soil will be used for leveling fish pond; iv) no operation of heavy equipment on the site, only transport vehicle which will be ran on the main road; v) main excavation activities will be schedule to implement during dry period. However, to minimize impact and ensure sanitation condition, the set of mitigation measures need to be implemented on the site.

103. Mitigation measures

- All activities of contractor only allow within the acquired land areas and no construction materials and/or wastes allow to be place in agricultural land;
- Excavated sludge will not be allowed to be temporary storage on the site; they are must immediately transported to disposal site in Nam Dinh village (which will be used to leveling the pond managed by To Hieu CPC) To Hieu Commune, Thuong Tin District. The contactor needs to reach an agreement with CPC and ensure that waste disposal is complied with regulation.
- Equip dustbins and mobility septic tanks to work sites (it is proposed that there will be 4 dustbins and 2 mobility septic tanks provided at each construction site). Then hiring Hanoi Urban Environment Company Limited to collect, transport to the approved landfill site.
- Reuse/recycle as much as possible construction solid waste such as empty cement sacks, wooden barrel, plastic, foam, cardboard boxes etc. The things that cannot be reused, disposed properly but not to leave them over soil surface.
- Disposal of solid wastes into canals, stream, other watercourses, agricultural field and public areas shall be prohibited
- Fuel and other hazardous substances shall be stored in areas provided with roof and way from any water bodies, as stated in TCVN 5507:2002- *Hazardous chemicals − Code of practice for safety in production, commerce, use, handling and transportation*;
- Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site. Then they should be transported to treat by a competent unit in accordance with the Circular No.36/2015/TT-BTNMT dated June 30th, 2015 issued by the MONRE regarding the hazardous wastes management.
- Compact at places with soil filling and excavation activity to mitigate soil erosion and washing.

d) Impacts on Local Traffic

104. Impacts: During the construction, the transport activities of materials for the construction will increase the volume of traffic for about 400 trips per 2 months (or about 8 trips per day). However, as observed that traffic networks are quite convenient in subproject areas, so many quality national highways (such as Hochiminh highways, Hanoi-Haiphong, Hanoi-Lao Cai highway, Lang Hoa Lac road, and National No. 1A and B…) which are connected the subproject areas thus only 8 trip/day generated from subproject activities will not be possible to cause any impact on traffic flow on these roads. The main impacts will be occurred at the local road No. 429 in Thuong Tin district and several earth roads around construction site. It is observed that road No. 429 is quire narrow and crowded with many commercial shops, operation of trucks, especially heavy trucks for electric equipment, may create high potential of traffic congestion, traffic accidents during rush hours and degradation of road surface. The access earth road from road No. 429 to construction site (about 300m), which is road to paddy field of local people and very narrow, close to private households. Operation of truck on this road may cause interruption road to field of local people, traffic accident at intersection point (between access road and road No. 429). However, these impacts is considered as minor since i) subproject plan to remove earth road to outside of expanded substation, which will be new constructed under project activates; ii) it is observed, very few people who are using the road; iii) generated trips of subject is quite small, only 8 trips per day; iv) only several heavy equipment will be transported to the

construction sites. However, to minimize the negative impacts, appropriate mitigation measures need to be implemented.

105. Mitigation measures

- Arrange reasonable work schedule to avoid rush hours to reduce traffic obstacle, the rush hours will be determined on the site since civil work have been started.
- Place sign boards near construction sites (2 warning boards on both direction of road No 429 at section close to Thuong Tin ENV office and 1 warning boards at the connection section between access earth road and road No. 429 and one on the main gate of existing Tia substation) to direct traffic means to slow down since go through construction area;
- Transport materials need to be within the allowable load. Not expand trucks' body.
- Obtain the agreement with local authorities in using the transport routes and record the status of the existing roads before construction and make proper compensation for the damages if any
- Set up construction site regulation for truck drive and provide training for them to increase responsibilities during driving the vehicles;
- Clear soil and construction materials which spill out on road surface. Recovery and compensation to ensure preconstruction status of the roads after completing the construction.

e) Occupational health and safety of workers

106. Impacts: Construction activities may cause health harm and danger of the workers' lives, specifically: i) accidents can be happened during operation of machines, vehicles; ii) traffic accident during transportation of facilities, materials for construction of the subproject; and iii) low quality of living condition may cause eye affection, skin disease and hear relative disease; iv)electric shocks during connecting and test electric with the existing substations. However, the risks/failures could occur at low probability because i) workers who operate machine will require professional skills as regulation; ii) as mentioned above, demand of transportation is not much; iii) as stated in design report, a temporary house will be built for workers on the site, which will help to ensure sanitation condition for worker camps; and iv) testing of electric equipment will require strict and specific procedures which will help to reduce electric shocks.

107. Mitigation measures:

- Health and safety plan (HSP) will be prepared and implemented by the contractor.
- All construction equipment, tools will be carefully examined for quality and quantity before used.
- Constructor need to work with CSC, PIC and Hanoi EVNPMU to establish labour safe regulations on the sites required by law and by good engineering practice, which include: electric safety, operating equipment -general safety requirements, general safety requirements.
- Workers shall be provided with appropriate personal protective equipment (PPE) such as safety shoes, hard hats, safety glasses, ear plugs, gloves, etc. at no cost to the employee.. and force them to use;
- A first aid kit will be provided at each construction site to ensure patients can receive first aid timely before transporting them to the medical station/hospital
- Contractors ensure to provide safe drinking water to workers for daily uses
- Strictly comply with safety norms for installation of electrical equipment and relative regulations.
- Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment.

- Use specialized tools and devices to anchor, fasten electrical equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes.
- Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people not on the duty must go out of the danger area.
- Fuse of the electrical networks connected to electrical equipment which will be installed, must be disconnected during the connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location.
- The danger areas must have signs.
- Safety and fire prevention for the construction area by some simple methods such as water tanks, sand tanks, buckets, shovels, fire ladder.
- Contact the local fire protection agencies to take measures to ensure safety in the fire prevention.
- Contractors will prepare emergency measures on time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid.

f) Community health and safety:

108. Impacts: Impacts on health and safety of local people may be included dust and noise generated from construction, which will be affected to several households (4 households) closed to the site and officers of Tia substation. Traffic safety is also main impacts in the main intersections, nearby roads as defined in Impacts on Local Traffic section due to road surface occupation, conflict between construction equipment and transport vehicles on the road. Electric shock and other accident may occur to local people since they are illegal entering construction sites. However, these impacts is considered as minors since: i) households who are living closes to construction sites; ii) construction activities will be very short time and within the ROW;

109. Mitigation measures: To mitigate these potential impacts, the civil contractor will develop a community health and safety plan (CHSP). The CHSP should include emergency response and preparedness procedures to be developed in close consultation with potentially affected communities of Tu Duong village and local authorities of To Hieu commune. The plan should include:

- Specific emergency response procedures for traffic accident, electrocution, oil spill. The detail guidance is described in the emergency response plan (Appendix C)
- Communication systems and protocols, interaction with local and regional emergency and health authorities;
- Install barriers (temporary fence) at construction areas to deter people access to the site;
- The local people shall not be allowed in high-risk areas (excavation sites and areas where heavy equipment is in operation);
- Remain the light during the nigh time on all construction sites.
- Provide warning signs as noted in Impacts on Local Traffic section;
- Assign several security persons on the construction sites.
- Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working in the substation

g) Social disturbance

110. Impacts: It is estimated that 30 workers will be mobilized on the construction site, and concentration of workers and poor housekeeping by contractors at work sites could lead to

several social problems on the sites such as

- Social evils and diseases transmission could negatively affect local residents as well as workers due to low living condition of worker which could leading to appearance of eye disease, skin disease, and respiration case in workers and then spreading out in the local communities.
- Conflict between workers and local people;
- Traffic safety in the main intersections as defined in Impacts on Local Traffic item. Uncontrolled and poor construction schedule could lead to high risks of traffic accident, especially during rush hours.

111. Surrounding household and residential area will be the main impacted objects, but the impact is considered as minor due to number of workers are quite small, construction activities mostly implemented within existing Tia substation and opened areas, only several households are close to sites. And impacts could be controlled through appropriate mitigation measures.

112. Mitigation measures

- The contractors will manage and educate workers to enhance their awareness of environmental sanitation and health protection. In order to minimize the risk of injury to the local residents and the workers, contracors provide the training for workers on occupational safety regulations and sufficient skill to communicate with local residents as stated in Decree No. 45/2013/ND-CP dated May 10th, 2013 of the GOV regarding the detailed regulation on some articles of the Labor Code on working hours, rest hours, occupational safety and occupational hygiene and Circular No. 22/2010/TT-BXD dated on December 03, 2010 of MOC on labour safety in work construction
- The constructors will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to To Hieu CPC during the construction phase. They need also establish the relationship with the local authorities to discuss and take decisions necessary for their management.
- Require workers shall not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws.
- Establish rules in camp. Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education needs to be given to workers.
- Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.

2. Repair and restore surrounding area after construction completion

113. Repair, restore, and return the ground after construction completion need to implement to mitigate impacts on environment after construction. The activities and measures are:

- Repair, recover, and return the road section leading from the road No. 429 to the substation gate, and public infrastructures damaged by the subproject construction.
- Implementation of these measures will be the responsibility of the contractor. PMB will be responsible for including these requirements in the contract documents.

C. Potential Impacts and Mitigation Measures during Operation Phase

114. Potential impacts on different environmental/social aspects and mitigation measures associated with the activities during the operation phase of the subproject are described as follows:

a) Occupational health and safety of the workers during the operation of the substation

115. Impacts: The occupational health and safety issues during the operation of high voltage substation include electrocution risk due to exposure to high voltage systems when maintaining and repairing the electric equipment; accident risk due to working in heights, potential exposure to electric and magnetic fields when maintaining and repairing the substation or working for long time in the substation. Other accidents that may occur include lightning, fire and explosion, tower collapse.

- *Exposure to high voltage systems*: Workers may come in contact with power lines/equipment during the maintenance and repair of the facilities and electrocution from direct contact with high-voltage electricity is a hazard directly related to facilities.
- *Working at height*: Accidents may occur when working at height. However, a working safety plan may be implemented to reduce risks that include testing of structural integrity prior to proceeding with the work and the use of fall protection measures.
- *Exposure to electric and magnetic fields* (EMF): Typically, workers repairing and operating the substation have higher exposure to EMF than community because of working in close proximity to electric power equipment.

Impact of EMF on operators when operating the substation is followed:

Using monitoring results of EMF in an existing operational 110kV Tia substation (Table 19), and given that operators of the new expanded substation are arranged to work in shifts, crews ensuring working time as stipulated, ensuring time for contacting with EMF, it is assumable that impact on local people caused by forecasted EMF of this subproject will be insignificant.

Table 19. 20Monitoring EMF in Tia 110kV substation during operation phase

TT	Monitoring location	Electric intensity (kV/m)	Magnetic intensity (A/m)
1	Control Room	0.06	0.32
2	22kV distribution room		
	In front of cabinet 432	0.001	0.44
	In front of cabinet 412	0.001	0.56
3	Outdoor equipment area		
	Transformer T2 on 110kv site	2.5	0.88
	Disconnectors 132-3	4.7	0,70
	Disconnectors 172-7	4.4	3.6
	Cutting machines 132	2.8	1.9
	Cutting machines 131	2.9	5.6
	Standard QD 183 NL/KHKT for working time 8h/day	**5.0**	**200.0**

(Source: Environmental monitoring report of Tia Substation, December 2015)

116. Mitigation measures: The operator of the substation will follow the EVN guidelines when working with electrical systems, particularly:

- Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers.
- Adherence to electrical safety standards.
- Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or working in the substation.

Occupational EMF exposure will be minimized through the implementation of an EMF safety program that includes:

- Identification of potential exposure levels in the working area including survey of exposure

levels and establishment of safety zones

- Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones.
- Utilization of personal monitors during work activities.
- Post safety signs and warning signs.

In addition, in the operation phase, training for workers will be conduct, so that worker can respond to risks/failures and meet the operation procedures. An emergency and safety guideline will be prepared and disseminated to the workers for handling risks/failures occurring in the operation process, e.g. risks of electric shock, fire, explosion, tower collapse. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the T/L. Equipment maintenance areas will be located away from the residential areas.

b) Community Health And Safety

117. Impacts:

- Electric shock risk: the community can be exposed to electric shock hazards as a result of direct contact with high voltage electricity or from contact with tools, vehicles, or other devices that come in contact with high-voltage electricity.
- Exposure to Electromagnetic Field (EMF): The transmission frequency commonly used in transmission systems ranges from 50 Hz - 60Hz which is considered to be an extremely low frequency (IFC, 2007). Effects reduce with distance and electric fields also become shielded by trees, buildings, and other materials that conduct electricity. In general electric fields are the strongest close to the source and diminish with distance.
- The subproject will be designed and constructed in compliance with regulations on technique and high voltage network, EMF must be ensured ≤ 5kV/m at any point outside the houses at the height of 1m from the ground and ≤ 1kV/m at any point inside the houses at the height of 1m from the ground. Therefore, impact on local people caused by forcasted EMF of this subproject will be negligible.

118. Mitigation measures:

To prevent electrocution risk, the substation operator will implement the following:

- Conduct earthing for all towers in the substation.
- To ensure absolute safety, operators must comply with operation procedures and safety requirements;
- Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working in the substation.
- Observe/Test EMF at resident's buildings for treating appropriately if any complaint.

119. To prevent impacts of EMF: The World Health Organization (WHO) reported that there is inconclusive evidence about substantive long-term health issues related to radiation emanating from low frequency electric fields at levels generally encountered by members of the community. Potential health effects associated with exposure to EMF is not well-established due to lack of empirical data demonstrating adverse health effects. However, the community will be warned about the safety distances from the houses or buildings surrounding the substation and earth zone are to be enforced by operation unit.

120. Climate Change. Regional Global Circulation modeling project greenhouse –climate change induced changes to the frequency and severity of rainfall events in the subproject area. However, there are no records of flooding in the area of Tia substation. However, short time flooding may occur due to low discharge rate of irrigation system. It is concluded that impacts from climate change may not impose long term risks for the whole substation area.

VII. GRIEVANCE REDRESS MECHANISM

121. A well-defined grievance redress mechanism will be established to address the APs' grievances and complaints regarding the environmental issues, land acquisition, compensation and resettlement in a timely and satisfactory manner. All APs in Tu Duong village will be made fully aware of their rights, and the detailed procedures for filing grievances and an appeal process will be published through effective information dissemination. Grievance redress mechanism and appeal procedures will also be explained in a subproject information booklet (PIB) that will be disseminated to CPC of To Hieu, who will inform to affected people for their reference.

122. APs are entitled to lodge complaints regarding any aspect of the affected environments, land acquisition and resettlement, problems such as, noise, pollution, entitlements, price and payment, and procedures for resettlement and income restoration programs. APs' complaints can be made verbally or in written form. In the case of verbal complaints, the grievance committee will be responsible for make a written record during the first meeting with the APs.

123. An appointed grievance committee with environmental and social issues will be set up in the local communes comprising of the local leaders. The designated communal officials shall exercise all efforts to settle the APs' issues at the commune level through appropriate public consultation. All meetings shall be recorded by the grievance committee and copies shall be provided to the APs. A copy of the minutes of the meetings and actions undertaken shall be provided to the EA/IA, and ADB as requested.

124. Procedures for grievance redress is defined as below and summarized in Figure 5. Procedures described below should apply easily to both social and environmental issues and be consistent with the legal procedures for grievances/disputes resolution in Viet Nam.

i. Step 1: APs can lodge their grievance/complaint verbally or in written form to the Contractor/HANOI DPMB because initial environment issues will be most likely be construction-related. The Contractor/HANOI DPMB is responsible for receiving, discussing, negotiating with the APs to solve their grievance/complaint within 15 days from the date the complaint is received. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

ii. Step 2: If no understanding or amicable solution can be reached or if no response is received from the Contractor/HANOI DPMB within 15 days from filing the complaint, the APs can elevate the case to the Ward/Commune People's Committee (CPC). The CPC will respond within 15 days upon receipt of APs complaints. All meetings shall be recorded and copies of the minutes of meetings will be provided to APs.

iii. Stage 3: If the AP is not satisfied with the decision of the Grievance Committee within 15 days since the date of submitting complaints, or in the absence of any response, the APs can appeal to the District People's Committee (DPC). The DPC will respond within 15 days from the day the complaint is received.

iv. Step 4: If the AP is still not satisfied with the decision of the District Office or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the Provincial People Committee (Hanoi People' Committee). Hanoi People' Committee will review and issue a decision on the appeal within 15 days from the day the complaint is received.

v. Step 5: If the AP is still not satisfied with the decision of the HCMC People' Committee or in the absence of any response within the stipulated time, the APs, as a last resort may submit his/her case to the Court at City level. The court will address the appeal by written decision and submit copies to the respective entities which include the EA, PPC, DPC, CPC and the APs. If, however, the AP is still not satisfied with the City Court's decision, the case may be elevated to the court at higher level (the Higher Court) (Figure 4).

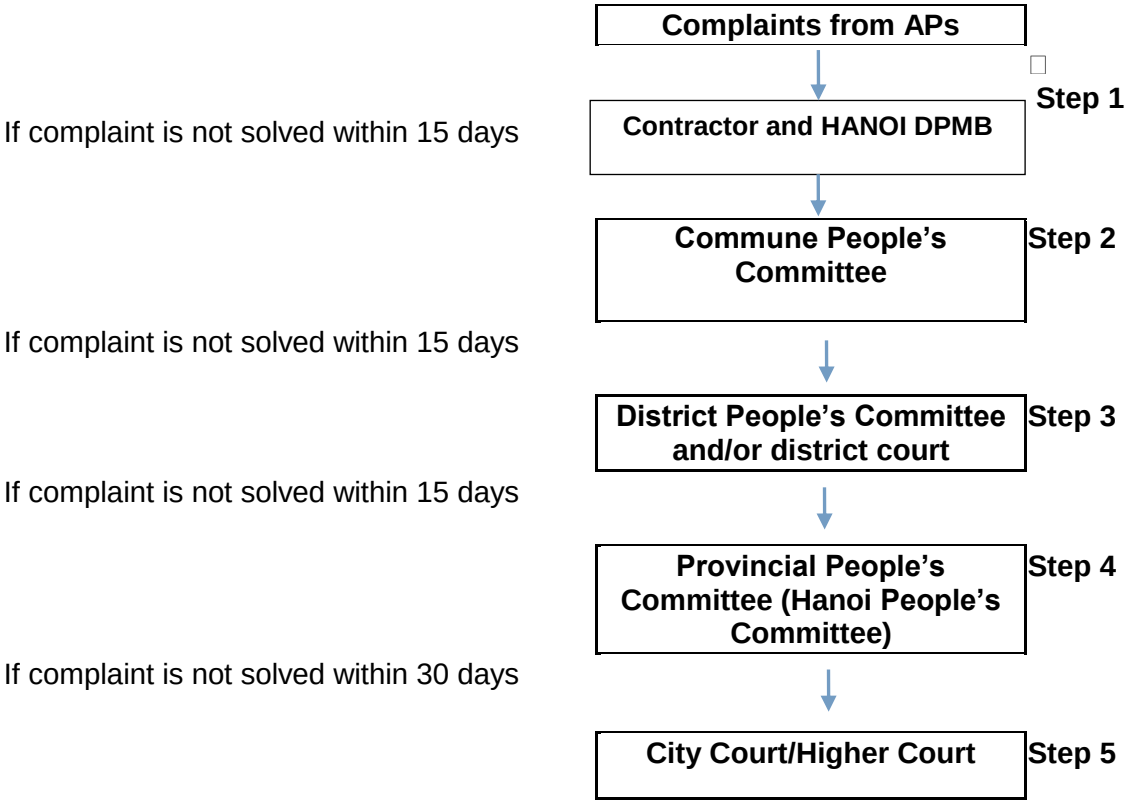


Figure 4: Public grievance redresses process

125. The EA and EVN will be responsible for checking the procedures and resolutions of grievances and complaints. The EVN/EA must have expertise and experience in social and environmental issues associated with infrastructure developments. The EVN/EA may recommend further measures to redress unresolved grievances. Environmental specialists will provide the necessary training to improve grievance procedures and strategy for the members of the grievance committee when required.

126. In cases, APs cannot write or are not unable to express their grievances verbally, they are encouraged to seek assistance from the local authority, NGOs, or other members in their family, village heads or community chiefs in order to their grievances to be recorded in writing, and to approach to the documents, and any survey or valuation of assets, to ensure that where disputes occur, all details have been recorded accurately enabling all parties to be treated fairly. Throughout the grievance redress process, the responsible agency will ensure that the concerned APs are provided with copies of complaints and decisions or resolutions reached.

127. If all efforts to resolve disputes under the grievance procedures remain unresolved or unsatisfactory, AHs have the right to directly discuss their concerns or problems with the ADB office in Southeast Asia through the ADB office in Viet Nam. If AHs are still not satisfied with the responses of the ADB office in Viet Nam, they can directly contact the ADB Office of the Special Project.

VIII. ENVIRONMENTAL MANAGEMENT PLAN

128. An EMP has been prepared for the subproject “Increasing the capacity of transformer T2, renovating bay of 110kV Tia substation-E10.4” with the purpose of integrating the results of the IEE into a formal management plan that is implemented parallel with the subproject to prevent or minimize potential environmental impacts and issues that were identified by the IEE. The EMP addresses the results of the public consultations on the subproject that were convened as a part of the IEE.

129. The EMP consists of an impacts mitigation plan, a monitoring plan, and an emergency response plan. EMP also prescribes the institutional responsibilities for the implementation of the EMP. EMP is a management tool that provides a set of directives and guidelines that the subproject owner follows to prevent or minimize unnecessary environmental impacts of the subproject.

130. Environmental impact mitigation plan has been developed based on each subproject activities with respective impact and mitigation measure. Also, the plan identifies the reports, responsibility of subproject’s stakeholders as well as estimated cost for implementing mitigation measures. Detailed contents are shown in Table 20.

Table 21: Environmental Impact Mitigation Plan

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
Pre-Construction, Detailed Design Phase								
Land acquisition and compensation	Acquired land area consists of 124,5 m^2 private paddy land of 2 households and 3936.42 m^2 public land of To Hieu commune People Committee Impacts on local people's life and economy	1. Affected persons are informed ahead of the subproject implementation and participated in acquisition and inventory of land, consulted in compensation, assistance. 2. Compensation and resettlement activities need to: 3. Strictly comply with approved updated resettlement plan of Tia subproject 4. Comply with the regulations of the Land Law 2013 and decrees, circulars, decisions on compensation, assistance and resettlement of the Government and Hanoi People's Committee. 5. Comply with the regulations of the Electricity Law, the Decree No. 14/2014/ND-CP and relevant regulations. 6. Ensure compensation payment to be implemented clearly, openly and fairly in compliance with legal regulations 7. Budget for compensation payment must be enough and available. 8. Coordinate to address people's claims/grievances relating to compensation. 9. Reinstate access road to paddy field for local people	All affected persons in the subproject area of Tu Duong village	Before implementing the subproject	See resettlement plan	See resettlement plan	IA/EO	Compensation and resettlement committee
UXO clearance (bombs, mines and other explosives)	Impact on people's and worker's safety	10. Engage an authorized UXO clearing contractor, the execution of demining and UXO is done following these steps: + Covering UXO detection and clearance area, + Clearing the grounds + Detection by the detector to a depth of 0.3m	All construction sites of Tia substation	At the beginning of the subproject construction	Once	See monitoring plan below	EO/IA	Hanoi EVN PMU

[2] Costs will need to be updated during detailed design phase.

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		+ Mark, digging test and resolve signal to a depth of 0.3m + Detect bomb by detector to a depth of 5m (put in step with high sensitivity) + Excavation, checked resolve signal to a depth of 3m + Excavation, checked resolve signal to a depth of 5m 11. Collecting, sorting, transportation management and destruction of mines and explosives are under strict safety standards for preservation, transport and use of explosives in QCVN 02:2008/BCT on National technical regulation on safety in the storage, transportation, use and disposal of industrial explosive materials, and the other current regulations. 12. Ensure that the contractors shall only commence site works after the UXO clearing agency has certified that the project areas are already been cleared						
Construction Phase of 110 kV Tia Substation								
Concentration of workers and domestic wastes generated	Generate domestic wastes causing environmental pollution; generate social problems, spread diseases	13. Provide mobile WC with septic tank for camp and dustbins at camp for collecting domestic sewage, rubbish and treating them adequately. 14. Worker camp must have adequate rainwater drainage system. 15. Examine periodically worker health. Equip medicine cabinet for protecting workers' health in time. 16. Manage, propagandize and educate to enhance the awareness of environmental sanitation and health protection for workers. 17. Construction units need implement temporary residence registration for all construction workers to To Hieu CPC	Worker camp	Throughout construction phase	Monthly	No marginal cost Include in the civil work contract	IA/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		within the project area. They need also establish the relationship with the local authorities to discuss and take decisions necessary for their management 18. Require workers not to take part in or cause social evils. 19. Establish rules in camp. Propagandize, educate workers and create good relations with people in order to avoid conflicts arising. HIV/AIDS education need to be given to workers. 20. Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.						
Excavation activities, usage of fuel and hazardous substance, installation of equipment, devices, machines and transportation means	Generation of waste and Cause soil and surface water pollution	Domestic waste management: 21. Use the excavated soil for filling expended area, which is fish pond as much as possible. 22. Collect, salvage matters such as steel pieces, cement sacks, wooden barrels etc. to reuse. For other refused construction materials which cannot be reused, hire local competent unit for collecting and transporting to the disposal site for burying along with rubbish. 23. Equip dustbins and mobility septic tanks to work sites (it is proposed that there will be 4 dustbins and 2 mobility septic tanks provided at each construction site). Then hiring Hanoi Urban Environment Company Limited to collect, transport to the approved landfill site; 24. Excavated sludge will not be allowed to be temporary storage on the site, they are must immediately transported to disposal site 25. Disposal of solid wastes into canals, stream, other watercourses, agricultural	All construction sitesat Tia substation	Throughout construction phase	Monthly	See Environmental Monitoring Plan (EMoP)	PIC / EO and DONRE	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		field and public areas shall be prohibited Hazardous waste impact mitigation 26. Fuel and other hazardous substances shall be stored in areas provided with roof and way from any water bodies, as stated in TCVN 5507:2002- Hazardous chemicals − Code of practice for safety in production, commerce, use, handling and transportation. 27. Hazardous wastes such as paint containing can, clouts with oil and grease, failed fluorescent lamp, etc. must be collected into tanks and kept temporarily at the construction site. Then they should be transported to treat by a competent unit in accordance with the Circular No.36/2015/TT-BTNMT dated June 30th, 2015 issued by the MONRE regarding the hazardous wastes management.						
Excavation activities, , installation of equipment, devices, machines and transportation	Water pollution	For construction wastewater: - Schedule excavation activities during dry season to reduce volume of runoff water, the dry season in the Hanoi is from November to April; 28. Waste water will not be allowed to discharged to surrounding areas, through strictly supervision of compliance performance of contractors; ; 29. Construct construction wastewater collection holes for depositing suspended solid and provide a connection pile section to utilize the existing drainage system in the subproject areas for discharging this type of wastewater. 30. Location of material storage areas on the site need to keep distance from water bodies and cover during rainy time; 31. The placement of washing						

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		instruments/vehicles next to the water bodies, canals (identified in Water quality impact section) will not allowed						
Sand and soil exploitation	Water, soil and air pollution on the borrow pits and sand mine	32. Sand volume for pond filling is about 9,805.8 m3, which will be purchased from local providers with have DONRE authorized, the contractors need to be check operation license of providers ; 33. Extraction of sand in river beds shall be prohibited except: (i) where this is no technically and economically feasible alternatives and (ii) provided specific mitigation measures are implemented to minimize impact on river morphology, water quality (e.g., turbidity) and aquatic ecosystems (e.g., reduced extraction during fish spawning period); 34. Monitoring the implementation of environmental protection measures at the soil pit and sand mines done by suppliers						
Excavating and filling fish ponds and transportation of materials, installation of equipment, devices, machines	Noise, dust and exhausts impact on ambient air environment quality	35. Transportation means, machines and equipment in list of means, machines and equipment to be obliged to register technique and environment safety must have effective certificate of environmental standards achievement issued by the register department. 36. Water need to be sprayed at the construction sites, access road from road 429 to construction site when dust is visible (road 429 and access road to the existing substation) to minimize dust. 37. Means transporting construction materials in and out of the project site must be covered by canvas. 38. Temporary stockpiles/storage yards located inside the existing substation will be covered, and located away (50m) from household and Tia substation, Thuong Tin ENV offices, cover canvas or water	All construction sitesat Tia substation	Beginning of construction (for license of equipment, machines and means) and throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/Contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		materials storage yards/stockpiles such sand, cement, filling soil etc. 39. Reduce excavation and filling duration, and excavated soil should be used to fill right after complete work. 40. Implement appropriately equipment, machines and vehicles maintenance. 41. Equipment and truck will not allow to be operated at night in the construction sites and access road to minimize noise; 42. Soil scattered on the paved road and public road shall be removed immediately 43. Schedule to ensure that excavation and filling work will be conducted section by section and reduce ann use excavated soil to fill fish pond right after completion of excavation work to reduce dust emission 44. Construction materials (e.g., sand, gravel, and stone) that are transported by trucks will be covered by canvas and all trucks used should have well fitted bodies and not be overtopped in loading to avoid soil scattering 45. Drivers will be requested not to make horn and to turn of the truck engine when stopping at the clouded residential area to reduce noise and gas emission.						
Construction materials transportation,	Traffic accidents, increase in traffic activities, damage to roads, traffic disruption	46. Contact with management unit of the roads for coordination to ensure construction safety and uninterrupted traffic activities. 47. Arrange reasonable work to avoid traffic obstacle. 48. Set up signal light when constructing at night. 49. Place sign boards near construction sites (2 warning boards on both direction of road No 429 at section close to Thuong Tin ENV office and 1 warning boards at	All construction sitesat Tia substation	Throughout construction phase	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		the connection section between access earth road and road No. 429 and one on the main gate of existing Tia substation) to direct traffic means to slow down since go through construction area. 50. Set up construction site regulation for truck drive and provide training for them to increase responsibilities during driving the vehicles. 51. Limit transportation of materials in rush-hours. 52. Transport materials with the allowable load. Not expand trucks' body. 53. For oversize and/or overweight materials and equipment, it must have special purpose transport means. 54. Conduct road upgrading or repair if collapse occurrence due to the subproject construction. 55. Clear soil and construction materials on road surface; level, compact, recover and return the initial status of the roads just after completing the construction.						
Transportation and installation of equipment	Occupational health and safety of workers. Worker injury and health	56. Health and safety plan (HSP), which includes all related mitigation measures described in Chapter VI will be prepared and implemented by the contractor. 57. Constructor need to work with CSC, PIC and Hanoi EVNPMU to establish labour safe regulations on the sites required by law and by good engineering practice, which include: electric safety, operating equipment -general safety requirements, general safety requirements 58. Workers shall be provided with appropriate personal protective equipment (PPE) such as safety shoes, hard hats, safety glasses, ear plugs, gloves, etc. at no cost to the employee.. and force them to use	All construction sitesat Tia substation	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		59. All workers will be examined health. 60. All construction equipment, tools will be carefully examined for quality and quantity before used. 61. A first aid kit will be provided at each construction site to ensure patients can receive first aid timely before transporting them to the medical station/hospital 62. Contractors ensure to provide safe drinking water to workers for daily uses. 63. Use suitable means of transport. Check the load of the vehicles before use, fasten and comply with safety regulations on transportation. 64. Strictly comply with safety norms for installation of electrical equipment and relative regulations. 65. Workers conducting transport and installation of electrical equipment must understand regulations on installation and transport safety of electrical equipment. 66. Use specialized tools and devices to anchor, fasten electrical equipment during movement and installation process. Not use steel wires, cables, chains to tie the insulation parts, the connectors of the base holes. 67. Before switching on power to test the power grid and electrical equipment, it must stop relative all works and people not on the duty must go out of the danger area. 68. Fuse of the electrical networks connected to electrical equipment which will be installed, must be disconnected during the connection time. Fuse is only closed to adjust the equipment after everyone is in a safe location. 69. Pay attention to prevent land subsidence when installing equipment by crane, take						

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		safety measures for human and devices when transporting supplies up 70. The danger areas must have signs. 71. Safety and fire prevention for the construction area by some simple methods such as water tanks, sand tanks, buckets, shovels, fire ladder. 72. Contact the local fire protection agencies to take measures to ensure safety in the fire prevention. 73. Contractors will prepare emergency measures on time. When accident occurs, conduct in-site first aid, then quickly drive the wounded to hospital for treatment. It must keep a phone number of the nearest hospital to call ambulance. Besides, it must be equipped medicine cabinet for aid. 74. The contractor will be required to provide first-aid facilities for the workers. At least one trained first-aid worker should be available at each construction camp. 75. PMB will be responsible for including these requirements in the contract documents.						
Transportation of construction material; installation of equipment and construction activities	Community health and safety is impacted. Local people injury and health	76. Install barriers (temporary fence) at construction areas to deter people access to the site; 77. The local people shall not be allowed in high-risk areas (excavation sites and areas where heavy equipment is in operation); 78. Remain the light during the nigh time on all construction sites. 79. Provide warning signs as noted in Impacts on Local Traffic section; 80. Assign several security persons on the construction site; 81. Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach	All construction sitesat Tia substation	Throughout construction phase (fulltime)	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		distances for excavations, tools, vehicles, pruning, and other activities when working in the substation. 82. Observe/Test EMF at resident's buildings for treating appropriately if any complaint.						
Concentration of workers in the subproject site causes social evils	Concentration of workers people in the subproject site may cause disorder, insecurity and disturbance in the locality due to conflicts between workers and local people, social evils; increase possible infectious diseases generation	83. Manage and educate workers to enhance their awareness of environmental sanitation and health protection. 84. In order to minimize the risk of injury to the local residents and the workers provide the training for workers on occupational safety regulations and sufficient skill to communicate with local residents as stated in ecree No. 45/2013/ND-CP dated May 10th, 2013 of the GOV regarding the detailed regulation on some articles of the Labor Code on working hours, rest hours, occupational safety and occupational hygiene and Circular No. 22/2010/TT-BXD dated on December 03, 2010 of MOC on labor safety in work construction 85. Equip medicine cabinet for protecting workers' health in time. 86. Construction units will implement temporary residence registration and provide accurate information about the quantity and stay time of all construction workers to To Hieu CPC during the construction phase. They should also establish the relationship with the local authorities to discuss and take decisions necessary for their management. 87. Require workers not to take part in or cause social evils; any contravener shall be strictly treated in accordance with laws. 88. Establish rules in camp. Propagandize, educate workers and create good relations with local people in order to avoid conflicts arising. HIV/AIDS education should be given to workers.	All construction sitesat Tia substation	Design and construction phases	Monthly	No marginal cost	PIC/EO	ES/contractor

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		89. Require workers to respect and not to violate the cultures, habits and customs, religious beliefs, historical and cultural parks, pagodas, and temples in the localities.						
Repair, restore, return the ground after construction completion	Mitigate impacts on environment after construction	90. Repair, recover, and return the road sections, and public infrastructures damaged by subproject construction. 91. Clear, level and restore the ground after construction completion. 92. Implementation of these measures will be the responsibility of the contractor. PMB will be responsible for including these requirements in the contract documents.	All construction sitesat Tia substation	Throughout construction phase until the project is put into operation.	Monthly	No marginal cost	PIC/EO	ES/contractor
Operation phase of Tia 110 kV Substation								
Operation of the substation	Affect workers' health and safety	93. Restricting access to electrical equipment, except workers who are trained and certified to work on electrical equipment. Properly limit time for contacting with EMF for trained workers. (i) Adherence to electrical safety standards. (ii) Provision of PPE for workers, safety measures, personal safety devices, and other precautions during maintenance work or working in the substation 94. Follow safety measures when working at height during maintenance and repair the connection line in the substation, particularly: (i) All workers must be examined health for working at height, equip sufficiently labor protection tools and cloths. (ii) All equipment, tools and means should be carefully examined for quality and quantity before used. It should carefully check the suspending cables before climbing on the tower.	Tia Substation	Fulltime	Biannual	O and M	The high voltage grid management of Ha Noi City	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
		(iii) Not permitted to work at height when it is going in night; it has fogs; it has strong wind with above class V. 95. Occupational EMF exposure should be minimized through the implementation of an EMF safety program that includes: (i) Identification of potential exposure levels in the working area including survey of exposure levels and establishment of safety zones (ii) Properly limit time for contacting with EMF for trained workers as stipulated and those equipped with appropriate PPE when entering safety zones. (iii) Utilization of personal monitors during work activities. (iv) Post safety signs and warning signs. 96. In addition, in the operation phase, conduct training for workers in order that they can respond to risks/failures and meet the operation procedures. An emergency and safety guideline needs to be prepared and disseminated to the workers for handling risks/failures occurring in the operation process. Coordinate with the local authorities at commune, district levels to propagandize, disseminate knowledge of safety of the ROW to communities and residents living near the substation. Equipment maintenance areas must be located away from the residential areas.						
Operation of the substation	Community Health and Safety may be affected by: Electric shock risk and Exposure to Electromagnetic	97. To prevent electrocution risk, Hanoi Power Company will implement the following: (i) Conduct earthing for all towers in the substation. (ii) To ensure absolute safety, operators must comply with operation procedures and safety requirements;	Tia Substation	Fulltime	Biannual	O and M	The high voltage grid management of Ha Noi City	

Subproject Activity	Potential Environmental Impacts	Proposed Mitigation Measures	Location	Timing	Activity Reporting	Estimated Cost[2] (USD)	Responsibility	
							Supervision	Implementation
	Field (EMF):	(iii) Periodically check the distance from wire to the ground and/or other objects as stipulated. Monitor minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working in the substation. (v) Observe/Test EMF at resident's buildings for treating appropriately if any complaint. 98. To prevent impacts of EMF: the community should be warned about the safety distances of buildings surrounding the substation and earth zone are to be enforced by operation unit.						

A. Institutional arrangements and responsibilities

131. Responsibilities for implementing the EMP shall be borne by all stakeholders in the project implementation process, including:

- Electricity of Vietnam is the Executive Agency responsible for implementing the entire project and implementation of the EMP and in the case of necessity will review and adjust the EMP accordingly. Hanoi Power Management Board representative of the Contractor will directly implement all related content, including direct responsibility for the management, implementation, support and supervision of compliance of contractors; evaluate EMP performance and report to EVN and ADB upon request.
- The Contractor will make plans necessary for the implementation of the EMP as required and ensure strict implementation of the mitigation measures in the EMP.
- The Environmental Supervisor of the Contractor supervise the Contractor's compliance with the EMP, environmental monitoring in the field. Local governments and communities are responsible for monitoring the implementation of the EMP as brought forward in the commitment of the Contractor.
- The Department of Natural Resources and Environment (DoNRE) is the provincial agency which oversees environmental management of Ha Noi. The DoNRE with District staff provides direction and support for environmental protection-related matters including application of the Law on Environmental Protection (2014), EIA, and environmental standards.
- ADB provides guiding documentation for EVN or PMU on issues related to EMP, and evaluate the periodic reports on activities of EMP submitted.

132. The specific responsibilities of the parties concerned are indicated in the Table 21:

Table 22. Stakeholder's responsibilities

Stakeholder	Responsibilities
Electricity of Vietnam	• General oversight role in the construction phase • Overall responsibility for the implementation of the EMP during operational phase • Review reports of the Independent Environmental Monitoring Consultant (IEMC). • Approve changes in EMP if necessary
Hanoi Power Management Board	• Establish an Environment Unit led by an Environmental Staff to implement EMP tasks • Manage, implement and supervise the compliance of the EMP and any conditions for approval, including the supervision of construction and operation of all Board staff and Contractor • Evaluate the performance of EMP and conduct revisions, or suspension of operations in cases of violating the conditions of the EMP, which can cause serious impacts on the local community. • Ensure the effective communication and dissemination of content and requirements in EMP to the Contractor. • Assist the Contractor in implementing sub-plans • Supervise EMP performance • Report EMP performance to EVN, ADB • Prepare summary reports on Project's environmental activities upon request • Brief the Project's information in community meetings • Ensure continuing communication with local communities and fulfill

Stakeholder	Responsibilities
	commitments to facilitate for community consultations during project life.
Construction Supervision Consultant (CSC)	• Prepare and implement Environmental Supervision Plan during construction phase • Prepare and implement Environmental Monitoring Plan during construction phase • Report on any incidents or non-compliances of EMP to PPMB • Ensure adequate education and training to all staff related to environmental supervision • Provide recommendations on EMP performance to PPMB
Project Implementation Consultant (PIC)	• Assist EVN/PPMB in reviewing detailed design for the subproject to ensure mitigation measures being incorporated. • Assist EVN/PPMB for monitoring and evaluation of safeguards compliance • Maintain close coordination with the safeguard team throughout the project life. • Work with ESU to provide training for awareness building on safeguards issues • Support to prepare and review all reports prepared by the EO/IA and the EMC for the EA and the ADB;
Environmental Staff (ES) of the Contractor	Supervise/monitor the implementation the SEMP of constructor and all mitigation measures mentioned in part VI and table 15 for the construction phase of the subproject; and
	Prepare and submit monthly reports on any environmental issue mitigation and monitoring activities related to environmental included in work contacts with PO, including the SEMP at the construction site.
Contractor	Prepare and keep records and necessary data as required in EMP and submit to Supervision Consultant
	Ensure that workers are informed of purposes of EMP and aware of necessary measures to implement EMP
Local authority and community	Participate in monitoring EMP implementation

133. Hanoi Department of Natural Resources and Environment (DoNRE) is the provincial agency which monitors environmental management in the city. Hanoi DoNRE along with the district staff will provide direction and support for environmental protection-relating issues including application of the Law on Environmental Protection, EIA, and environmental standards.

134. ADB provides guidance to the EA/IA with any issues related to the EMP, and reviews every 6-month reports on the EMP activities compiled and submitted by the EA.

B. Monitoring Plan

135. The environmental monitoring plan for the EMP is provided in Table 22. The monitoring plan focuses on all three phases (pre-construction, construction, post-construction operation) of the subproject and consists of environmental indicators, the sampling locations and frequency, method of data collection, responsible parties, and estimated costs. The purpose of the monitoring plan is to determine the effectiveness of the impact mitigations, and to document any unexpected positive or negative environmental impacts of the subproject.

136. The standards for ambient environmental quality (e.g., water and air quality) for Viet Nam listed in section III will be the foundation for preparing the monitoring program. The environmental standards provided by the Environmental, Health and Safety Guidelines of the IFC/World Bank (2007) should be based to supplement standards that are not provided by the GoV.

137. After construction is completed the potential impacts of the operation of the subproject will be monitored by EVNHCMC. Monitoring of the success of the minor resettlement in the affected areas will be undertaken as part of the separate RP prepared for the subproject.

C. Performance Monitoring

138. Performance monitoring is required to assess the overall performance of the EMP. A performance monitoring system is normally developed by the EA for the subproject. Select indicators of major components of the environment that will be affected primarily by the construction phase are drawn from the mitigation and monitoring plans and summarized in Table 23.

Table 23. Environmental Monitoring Plan

ENVIRONMENTAL EFFECTS MONITORING							
Environmental Indicators	**Location**	**Means of Monitoring**	**Frequency**	**Reporting**	**Responsibility**		**Estimated Cost (USD)**
					Supervision	**Implementation**	
Construction Phase of Tia 110 kV Substation							
A) Air quality and microclimate: dust -Noise B) Domestic (worker) and construction solid waste inside and outside construction sites including worker camps. C) Public comments and complaints D) Incidence of worker or public accident or injury	A): Baseline sites of pre-construction phase. B) All construction sites and worker camps C) Using hotline number placed at construction areas D) At all construction areas	A) Using field and Visual observation. Include visual observations of dust and noise from contractor and public reports. B) Using field and estimated methods C) Information transferred by telephone hotline number posted at all construction sites. D) regular reporting by contractors.	(A): Quarterly during construction periods Daily visual records B) Daily visual records C) Continuous public input D) Continuous	Quarterly	(A - B) will be conducted by CSC, EVNHANOI /PPMB and PIC		no marginal cost
					CSC, EVNHANOI /PPMB and PIC	Constructor	no marginal cost
					EVNHANOI /PPMB	Contractor (C and D) and daily observations:	no marginal cost
Operation of Tia kV Substation							
Incidence of worker accidents, or spills on hazardous materials, noise and EMF	At substation	Regular documentation and reporting	Continuous		EVNHANOI /PPMB		O and M

Table 24.Performance Monitoring Indicators for Subproject

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Pre-construction Phase				
Land acquisition and compensation	Mentioned in Table 20	Mentioned in RP	Mentioned in RP	Resettlement Plan
UXO	Mentioned in Table 20	UXO disarmament	No risk of life safety of workers and people	Monitoring by PIC/PMB
Construction Phase				
Concentration of workers and domestic wastes generated	Mentioned in Table 20	Hygiene situation, availability of toilet and waste basket Residential register of workers Rainwater drainage system in worker camps Food safety regulations Educating and training about health and hygiene for workers	Rigorous program of procedures to manage worker's camp	CSC and contractor monitoring reports
Refused soil, debrides, other hazardous wastes generated by soil filling, excavating activities and equipment, devices, machines and transportation means	Mentioned in Table 20	Solid waste and liquid waste treatment facilities Hazardous waste: Oil, gasoline, grease collection and treatment license	- Rigorous program of procedures to manage and store all waste from construction camps and sites practiced, and manage earthworks. - Rigorous program of procedures to manage and store all waste from construction camps and sites practiced.	CSC and contractor monitoring reports,
Noise, dust and exhausts due to construction activities and transportation of materials	Mentioned in Table 20	Performance of contractors dust, CO, NO_x, SO_2, noise levels meet Vietnamese standards	The content must not exceed the level at pre-subproject. Complying with mitigation measures for water quality Mentioned in Table 31	CSC and monitoring report of contractors
Construction materials transportation, and storage	Mentioned in Table 20	Frequency of disruptions and blocked roadways is reduced Maintenance and operation method of equipment, machines, and vehicles	Disruptions, stoppages, or detours are managed to absolute minimum.	Public input, contractor reports, CSC reports
Occupational health worker safety	Mentioned in Table 20	Frequency of injuries are reduced	Adherence to GoV occupational health and Safety regulations	Contractor, CSC reports

Activities of subproject	Mitigation activities	Key Indicator	Performance Objective	Data Source
Community health and safety is impacted. Local people injury and health	Mentioned in Table 20	Record or compliance in the public safety relative issues	Safety for local communities during construction phase	Contractor, CSC reports
Repair and restore, surrounding environment after construction completion	Mentioned in Table 20	Remain construction material at the site are collected Construction solid waste; un-clearance of worker camp etc. are cleaned.	Recovery of construction site; remove construction solid waste; clean worker camp etc.	Site observation; Contractor and CSC monitoring reports
Operation phase of Tia substation				
Operation of the Tia substation	Mentioned in Table 20	Frequency of accidents, and spills is reduced Electromagnetic field monitoring	No increase in pre-construction frequency	EVNHANOI

D. Reporting

139. Regular reporting on the implementation of mitigation measures and on monitoring activities during construction phase of the subproject is required. Reporting is the responsibility of IA/ESU and should be conducted in conjunction with regular meetings with stakeholders as part of the continuation of stakeholder communications. The mitigation and monitoring plans (Tables 20 and 22) summarize proposed timing of reporting which is on monthly basis.

140. A report on environmental monitoring and implementation of EMP will be prepared quarterly for the EA by the IA/ESU. The IA report will compile monthly reports provided by the EO of contractor, the reports of the CSCon monitoring, and input from the ES of the PIC. The IA/ESU report will also be sent to the DONRE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators (Table 23), and will include relevant Gov. environmental quality standards.

IX. ESTIMATED COST OF EMP

141. The costs for implementing the EMP are primarily for implementing impact mitigation measures that however are included with the construction costs in contractor bid documents. The detail cost description is summarized in Table 24.

Table 25 Estimated costs for Environmental Monitoring Plan of EMP

Activity Type	Estimated Cost (USD)
Construction Phase	
Monitoring environmental quality	No marginal cost. It will be included in the construction contract of constructor
Inspecting environmental compliance	No marginal cost. It will be included in the construction supervision Consultant's contract
Operation Phase	
Monitoring environmental quality (electromagnetic measurement)	No marginal cost. It will be included in the operation budget of the substation
Training and capacity development of EVNHN/ PMB	No marginal cost It is included in the PIC cost

142. Thus, the cost for EMP is included in working contracts of all working contract of all units

IX. INFORMATION DISCLOSURE AND PUBLIC CONSULTATION

A. Public consultation

143. A public consultation strategy with the stakeholders was established to meet the requirements of the consultant as stipulated by the SPS (2009). This strategy embodied the principles of meaningful, transparent and comprehensive consultation to ensure that affected people groups and fragile people groups such as women and poor people, were given equal opportunities to participate in the design of the subproject.

1. Identification of Stakeholders

144. Stakeholders were identified and participated in consultation. Communication with Stakeholders focused on the affected organizations and communities, and persons directly affected by the proposed subproject. The stakeholders of the subproject include:

- Institutional stakeholders such as: (i) People's committee of the village and commune, (ii) Project management agency, (iii) IEE preparation consultant, and (vi) commune/ward leaders;
- Organizations/unions/associations such as Women Union and Farmers Union which provided various information for the design of the subproject, and which might participate in implementation of measures and interventions;
- Households living surrounding the substation can be people who will be directly affected or be adversely impacted or can be people who will be received benefits from the determination and implementation of mitigation measures against adverse impacts, and
- Organizations, individuals affected by the subproject.

2. Public consultation meeting

145. Formal public consultation meetings were held to discuss the location and impacts of "110 kV Tia substation" in Tu Duong village-To Hieu commune, Thuong Tin District-Hanoi city on 2 February2016, with the total of 23 participants (including 3 females).

146. Public consultation meetings consisted of the following three component procedures:

i. Engineering consultant introduced the subproject "Tia substation" and the length of the transmission line that will cross over the communes and wards.

ii. Environmental consultant presented environmental policy, safety regulations of the ADB and the Vietnam power sector, anticipated environmental impacts and respective mitigation measures (to be developed in the IEE), grievance redress mechanism for environmental and resettlement problems; and

iii. Social/resettlement consultants presented: ADB's resettlement plan; impacts due to land and properties acquisition; policies of the GOV and local authorities, the Project's policies on compensation for the losses when the State acquires land and properties on land; and potential impacts due to land acquisition/resettlement.

147. During the meeting, people presented their questions and comments on environmental issues. Environmental

148. Consultants answered and explained all questions of the participants.

149. Participants of the public consultation meeting included the commune/ward leaders, the representatives of Vietnamese Fatherland Front of the locality and the affected organizations/unions. List of participants in the public consultation meetings sees in appendix B.

3. Results of public consultation

150. Comments/questions of the local authorities/people include as follows (Table 25):

Table 26: Summary of feedbacks/ questions of the local authorities and people, Project Owner's /Consultant's answer, and project's response

Comments/questions of the local authorities and people during the public consultation meetings	Project Owner's/ Consultant's answer	Project's response (issues are addressed by EMP or RP)
Those Households hiring the aquaculture land (over 40 years) requested a satisfactory compensation to support them to ensure living conditions after the project is completed.	The Project Owner (PO) will ensure compensation for damages to be implemented in compliance with the Governmental regulations and Hanoi People's Committee.	Resettlement plan have been addressed this issue
Households with agricultural land (land 5%) suggest project to acquire the whole land plot because the remaining land is unusable for agricultural production due to distorted terrain, difficult cultivation and mouse vandalism	The Project Owner (PO) will ensure compensation for damages to be implemented in compliance with the Governmental regulations and Hanoi People's Committee.	Resettlement plan have been addressed this issue
Households living near substation request the project owner having measures to ensure the safety of magnetic fields, technical requirement and safety electrical grids.	The project owner will ensure the maintenance of the substation as in regulations of electric sector and timely repair when failure occurrence. EMF mitigation will be implemented as stipulated at the Decree No. 14/2014/ND-CP.	The EMP presented this issue. The EMP described impacts due to EMF and EMF monitoring when the project is put into operation to control impacts caused by EMF.
For environmental recovery after the subproject completion, the concrete road is proposed to be built to ensure convenient transportation and easy, good drainage system.	Agree. The PO presented in bidding document in order to require contractors for implementing environmental impact mitigation measures, including construction safety requirement	The EMP presented environmental protection measures, including environmental recovery after construction completed
During the construction process: dust, noise affecting residential areas around the substation area, mitigation measures should be applied to ensure a clean environment.	Agree. The PO presented in bidding document in order to require contractors for implementing environmental impact mitigation measures, including construction safety ensure	The EMP presented environmental protection measures, including impact mitigation measures due to dust, exhausts, and noise and safety ensure during construction.
The subproject is adjacent residential area at 3 sides. Thus the transportation of construction machinery to the subproject site should paid attention to traffic safety to	The PO will request constructor comply with regulations on traffic safety and apply mitigation measures to reduce air,	The EMP presented mitigation measures on transportation activity and safety and mitigation

Comments/questions of the local authorities and people during the public consultation meetings	Project Owner's/ Consultant's answer	Project's response (issues are addressed by EMP or RP)
the problem of noise and dust, environmental sanitation	water, soil pollution	measures to reduce air, water, soil pollution when implementing the project.
Before construction, constructor must fully inform the CPC, villages and population groups about construction schedule	Will do that	The EMP presented this issue.
The construction site borrowed from households should be agreed and rehabilitated tidily after construction is complete	Will do that	The EMP presented this issue.
Conclusion: To Hieu commune People committee and all affected people agree and will support the construction of the Tia substation		Follow-up the comments/feedbacks of the public consultation meetings held

B. Information disclosure

151. Formal information disclosure to the affected persons and stakeholders of "110 KV Tia Substation" subproject that presented in the IEE aims to the beginning of continued information disclosure and participation of relevant parties as the subproject is implemented. As part of the communication strategy for the relevant parties (stakeholders), regular information exchange meetings with stakeholders are strongly encouraged throughout the implementation of the subproject.

152. IEE must be easily to understand in order that the stakeholders can comment in written and verbal form in local language of Vietnamese. At a minimum, Executive Summary of the IEE should be written in Vietnamese and distributed to all PAPs. IEE should be available on the EVNHN website, at the EVNHN office in Hanoi, and at the subproject localities. Similarly, all reports on public consultation with the stakeholders, environmental monitoring, and EMP implementation prepared by the EA/IA should be available at the above websites, offices and localities. IEE will be available on the ADB website as well as EMP report that is prepared by the EA/IA after implementation begins.

153. The communal people's committees of To Hieu commune – Thuong Tin District and affected people were received the draft IEE in Vietnamese version during the public consultation process. The final IEE (after receiving the letter of No objection from ADB) will be translated into Vietnamese language, then send to each communal people's committees for disclosure. By doing this, local people and local authorities can easily refer the final IEE.

XI. EMERGENCY RESPONSE PLAN

154. The Contractor must develop emergency or incident response procedures during construction and operation phases of the 110 KV Tia Substations to protect workers and the public. The emergency response plan (ERP) outlines the roles and responsibilities of persons from first identification of an incident or emergency to the final steps of safe and complete closure of the situation. The detailed requirements for the ERP are described in Appendix C.

XII. INSTITUTIONAL CAPACITY REVIEW AND NEEDS

155. Currently there is insufficient experience and capacity for environmental assessment and management in EVNHN for the implementation of the EMP, and to develop future safeguards for the non-core subprojects. The PIC with assistance from the PMB/IA of the subproject will develop and deliver training courses to the PMB staff including the ES of the contractor. The purpose of the course(s) is to strengthen the ability of the subproject owner including the ES to oversee implementation of the EMP by construction contractors, and EMC. Costs for training should be included with costs for implementation of the EMP.

156. Training on the implementation of an EMP should address two thematic areas. The first area should be principles environmental assessment and management focused on the potential impacts of subproject activities on the natural and social environments. The second area should be environmental safeguard requirements of the ADB and Gov. with specific reference to the EMP.

XIII. CONCLUSIONS AND RECOMMENDATION

157. The initial examination of 110 kV Tia substation in Ha Noi indicates that potential environmental impacts are largely construction-related impacts and disturbances that can be mitigated and managed.

158. The civil construction impacts of elevated dust, noise, traffic disruptions and sedimentation, and public and worker safety are assessed as medium and can be managed effectively with standard construction practices.

159. The public consultation meetings underscored the need for effective management of construction impacts such as noise, dust, traffic disruptions, and public safety as indicated in EMP. Especially, the public concerns were raised on ensuring mitigation measures of the contractor, as well as the responsibilities of involved parties in cases of incidents and damage to property and threatening people's safety; rehabilitation of the area should be made in due time so that farmers can resume farming. The safe operation of the substation was significantly focused by local residents.

160. The IEE concludes that the description of the feasibility design of the subproject combined with available information on the affected environment is sufficient to identify the scope of potential environmental impacts of the subproject. Providing that significant changes do not occur to the design of one or more of the subproject components and those new sensitive environmental components are not identified in pre-construction phase, further detailed environmental impact assessment (EIA) of the subproject is not required.

IXV. REFERENCES

1 ADB, 2009. Safeguard Policy Statement, ADB Policy Paper.

2 ADB, 2003, Environmental Assessment Guidelines of the Asian Development Bank.

3 ADB, 2012, Environmental Safeguards, A Good Practice Sourcebook, Draft.

4 Social-economic Development Plan 2016 of To Hieu commune

5 General Statistics Office, 2013. Ha Noi City Statistical Yearbook 2013

6 MOC -Ministry of Construction, 2009. Vietnam building Code 02:2009/BXD.

7 World Bank Group, 2007. Environmental, Health, and Safety Guidelines. Washington DC, 96 pgs.

8 PEC, 2015. Project Technical Design report

9 Project Resettlement Plan

10 Tia 110kV substation environmental monitoring report 2015

11 Tia 110kV substation environmental monitoring report 2015

12 Tia 110kV substation Environmental Protection Report, 2012

XVI. APPENDICES

Appendix A. Rapid Environmental Assessment (REA) Checklist.

Appendix B. Minutes of Public Consultation Meetings.

Appendix C. Emergency response plan.

Appendix D. UXO clearance official letter

Appendix A: Rapid Environmental Assessment (REA) Checklist

Instructions:

(i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to Environment and Safeguards Division (RSES) for endorsement by Director, RSES and for approval by the Chief Compliance Officer.

(ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.

(iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title *110kV Tia substation*

Screening Questions	Yes	No	Remarks
A. Project Siting Is the Project area adjacent to or within any of the following environmentally sensitive areas?			
▪ Cultural heritage site		x	
▪ Protected Area		x	
▪ Wetland		x	
▪ Mangrove		x	
▪ Estuarine		x	
▪ Buffer zone of protected area		x	
▪ Special area for protecting biodiversity		x	
B. Potential Environmental Impacts Will the Sub-project cause…			
▪ Encroachment on historical/cultural areas, disfiguration of landscape and increased waste generation?		x	The subproject is not any near the historical/cultural areas.
▪ Encroachment on precious ecosystem (e.g. sensitive or protected areas)		x	
▪ Alteration of surface water hydrology of waterways crossed by roads and resulting in increased sediment in streams affected by increased soil erosion at the construction site?		x	There is no river, stream flowing through the subproject area
▪ damage to sensitive coastal/marine habitats by construction of submarine cables?		x	There are no submarine cables to be installed by the subproject.
▪ Deterioration of surface water quality due to silt runoff, sanitary wastes from worker-based camps and chemicals used in construction?		x	Construction waste water is discharged into the surface water; the turbidity parameter of water is raised by that. The mitigation measures will be implemented.
▪ Increased local air pollution due to rock excavation and filling, crushing?		x	There is no rock excavation and filling, crushing for constructing the subproject. Only use rock for concrete

Screening Questions	Yes	No	Remarks
			and preventing from collapse with 4 x 6 dimensions.
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation?	x		To minimize potential risks, an Occupational Health and Safety Plan (OHSP) will be developed and implemented.
▪ chemical pollution resulting from chemical clearing of vegetation for site clearance?		x	No used chemical clearing of vegetation.
▪ noise and vibration due to blasting and other civil works?		x	Minor impact level due to noise and vibration occurred during movement of construction vehicles along access road in construction phase
▪ Dislocation or involuntary resettlement of people?		x	There are no households who must be dislocated their houses/structures but there are 99 houses/structures within the ROW. Roof, wall of those structures must be improved or earthed.
▪ Dis-proportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		x	There are not ability happening. The social impact assessments are individual implement.
▪ Social conflicts relating to inconveniences in living conditions where construction interferes with pre-existing roads?	x		Small impact. The traffic will be obstructed during the stretching and scattering conductor. However, the mitigation measures had been advanced with high realization such as: to install scaffolds when stretching conductor through roads; to put the warning plate and barricade; to clean daily site for safe traffic.
▪ Hazardous driving conditions where construction interferes with pre-existing roads?		x	Small impact
▪ Creation of temporary breeding habitats for vectors of disease such as mosquitoes and rodents?		x	There are no water pools for a long time by subproject. Site always are cleaned and reinstated after the complete work.
▪ Dislocation and compulsory resettlement of people living in right-of-way of the power transmission lines?		x	No household need to be resettled
▪ Environmental disturbances associated with the maintenance of lines (e.g. routine control of vegetative height under the lines)?		x	No transmission line is constructed
▪ Facilitation of access to protected areas in case corridors traverse protected areas?		x	There are no protected areas in subproject area.
▪ Disturbances (e.g. noise and chemical pollutants) if herbicides are used to control vegetative height?		x	The herbicide is not used.
▪ Large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)?		x	The proposed labour is 30 people. The houses of local people will be employed for living so that the hygiene system and water supply system are not built.
▪ Social conflicts if workers from other regions or countries are hired?		x	Workers living subproject construction site can cause some impacts on local communes.

Screening Questions	Yes	No	Remarks
			For mitigation, contractors will be given preference to employ labour who is the local people.
▪ Poor sanitation and solid waste disposal in construction camps and work sites, and possible transmission of communicable diseases from workers to local populations?	x		Small impact. A worker camp will be constructed outsite the substation. The Contractor shall implement measures to ensure the hygiene and health of workers and local people.
▪ Risks to community safety associated with maintenance of lines and related facilities?		x	The risk from operation is rarely happen. A safe plan are prepared and implemented by operation unit.
▪ Community health hazards due to electromagnetic fields, tower fall down, lightning, land subsidence, lowered groundwater table?	x		Small impact. The electromagnetic field is periodically surveyed every six months; to put the emergency warning plate.
▪ Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		x	There are no transport, use, store and disposal of materials such as explosives for the subproject. The petrol using for machines, equipment and transport that will be bought at the depot in area that are not stored and transported.
▪ Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the subproject (e.g., high voltage wires, and transmission towers and lines) are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?		x	Low risk level. The project owner will strictly follow regulation stipulated in Decree No. 14/2014/ND-CP.

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks	**Yes**	**No**	**Remark**
▪ Is the Subproject area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes?	x		The subproject area has been suffered by local flood due to rain (flooded level about 20-30 cm). This is because of the effects of the urbanization process in the region. Also, the area has elevation about 5-10m which can be affected by tides and sea water level rises due to climate change.
▪ Could changes in precipitation, temperature, salinity, or extreme events over the Subproject lifes pan affect its sustainability or cost?		x	
▪ Are there any demographic or socio-economic aspects of the Subproject area that are already vulnerable (e.g. high		x	

incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)?			
▪ Could the Subproject potentially increase the climate or disaster vulnerability of the surrounding area (e.g., increasing traffic or housing in areas that will be more prone to flooding, by encouraging settlement in earthquake zones)?		x	

Appendix B. Minutes of public consultation

- Minute of public consultation meeting on environmental impact assessment, environmental management plan at Tu Duong village-To Hieu commune.

DỰ ÁN NÂNG CÔNG SUẤT MBA T2, CẢI TẠO NGĂN LỘ 110KV TBA TÍA - E10.4

BIÊN BẢN THAM VẤN CỘNG ĐỒNG

(Tham vấn các cơ quan/hộ dân bị ảnh hưởng)

I. Thời gian và địa điểm tham vấn

1. **Thời gian**: Ngày 02 tháng 02 năm 2016.
2. **Địa điểm**: ...UBND Xã Tô Hiệu, Huyện Thường Tín..., Thành phố Hà Nội.

II. Thành phần tham dự

1. **Đại diện UBND xã/phường .....**
   - Ông: ...Phạm Hữu Trí..... Chức vụ: ....CT- UBND.....
   - Ông: ...Lương Văn Mạnh..... Chức vụ: ...PCT- UBND.....
   - Ông: ....Lê Đắc Thanh..... Chức vụ: .....CT. Mặt trận Tổ quốc..
   - Ông: ....Nguyễn Thanh Tuyền.. Chức vụ: ....CB. Địa chính.....
2. **Đại diện các hộ dân bị ảnh hưởng (BAH)**
   Tổng số người tham dự họp: ....8.... người.
   Trong đó: Nam ...7.... ; Nữ: ....1.; Số người dân tộc thiểu số người: ..0....;
   Phụ nữ đơn thân ..0..; Thương binh..0.; Hộ nghèo..0.; Người già neo đơn.0.
   Độ tuổi tham dự khoảng .....
3. **Đại diện nhóm tham vấn**
   - Ông: ...Lê Đức Huy..... Chức vụ: ..Chuyên gia Tái định cư
   - Ông: ...Vũ Chí Công..... Chức vụ: ..Chuyên gia môi trường
   - Ông: ...Nguyễn Văn Bằng..... Chức vụ: ..Cán bộ hỗ trợ.....
   - Ông: ..... Chức vụ: .....

III. Mục đích và nội dung tham vấn

1. Mục đích

(i) Giới thiệu và phổ biến thông tin về dự án đến các hộ dân bị ảnh hưởng bởi dự án và các nguyên tắc về bồi thường, hỗ trợ; yêu cầu và mục tiêu của việc lập Kế hoạch Bồi thường và hỗ trợ cho Dự án "Nâng công suất MBA T2, cải tạo ngăn lộ 110kV TBA Tía - E10.4". Phát tờ rơi tóm tắt về dự án và Kế hoạch bồi thường, hỗ trợ;

(ii) Thu thập ý kiến, nguyện vọng của các hộ dân liên quan đến bồi thường, hỗ trợ, vấn đề về giới và nhóm dễ bị tổn thương, và tham vấn các biện pháp/chương trình phục hồi thu nhập cho người bị ảnh hưởng.

2. Nội dung

a. Phát tờ rơi thông tin về bồi thường, hỗ trợ và tái định cư của dự án;
b. Nhóm tham vấn giới thiệu và trình bày về dự án, mục đích và các nội dung tham vấn;
c. Thảo luận, lấy ý kiến tham gia của những người tham dự và những giải thích của nhóm tham vấn.

3. Tóm tắt kết quả tham vấn và ý kiến của những người tham dự

1

a. Các câu hỏi và các ý kiến thảo luận:

- Các hộ đồng ý với chủ trương theo chính sách của Đảng và Nhà nước để xây dựng mở rộng TBA Tía ngăn lộ 110kV. Đối với các hộ thuần thấu (trên 40 năm) đề nghị dự án có chính sách bồi thường, hỗ trợ cho các hộ dân thỏa đáng, đảm bảo được đời sống của các hộ dân sau khi dự án hoàn thành.

- Đối với các hộ có đất sản xuất nông nghiệp (đất 5%) đề nghị dự án thu hồi hết phần đất còn lại vì sau khi thu hồi diện tích còn lại không sử dụng được do địa hình méo mó, khó canh tác, chuột phá hoại.

- Nhà ở giáp với TBA đề nghị có biện pháp đảm bảo an toàn về tường rào, đảm bảo kỹ thuật và an toàn về điện.
- Việc thi công hoàn trả mặt bằng đường dân sinh đề nghị bê tông hoá, đảm bảo được đi lại được thuận tiện và dễ dàng, hệ thống thoát nước.
- Trong quá trình thi công bụi, ồn làm ảnh hưởng đến khu dân cư quanh khu vực trạm đề nghị có biện pháp đảm bảo môi trường trong sạch.
- Dự án có 3 mặt là đầu cả việc thi công đưa máy móc vào công trường phải an toàn giao thông, các vấn đề về tiếng ồn và bụi, vệ sinh môi trường.
- Trước khi thi công thông báo đầy đủ thông qua UBND xã, thôn, tổ dân phố được nắm rõ.
- Mặt bằng thi công mượn của các hộ dân cần được thỏa thuận, hoàn trả mặt bằng sạch sẽ khi thi công xong.

2

b. Một số ý kiến khác:

Biên bản kết thúc cùng ngày và đã được cuộc họp nhất trí thông qua.

Xác nhận của UBND Xã/ Phường…………… **Nhóm tham vấn**

PHÓ CHỦ TỊCH
Lương Văn Mạnh

Nguyễn Văn Đăng

Đại diện hộ dân

Phạm Thị Cúc

Ngô Hồng Thìn

Lê Đại Thanh.

3

List of participants in public consultation meetings

In Tu Duong Village-To Hieu commune on 2 February 2016

i. List of commune leaders participated interview

#	Name	Position	Address	Date
1	Phùng Thanh Tuyên	Commune Party Secretary	Tô Hiệu Commune	2/2/2016
2	Trần Văn Thắng	Commune Party Deputy Secretary	Tô Hiệu Commune	2/2/2016
3	Phạm Hữu Trí	Commune People Committee Chairman	Tô Hiệu Commune	2/2/2016
4	Lương Văn Mạnh	Commune People Committee Deputy Chairman	Tô Hiệu Commune	2/2/2016
5	Phạm văn Mỹ	Commune People Council Chairman	Tô Hiệu Commune	2/2/2016
6	Lê Đại Thanh	Fatherland frontier Chairman	Tô Hiệu Commune	2/2/2016
7	Ngô Minh Khôi	Commune Police Head	Tô Hiệu Commune	2/2/2016
8	Lương Xuân Hiệp	CPC officer	Tô Hiệu Commune	2/2/2016
9	Phạm Thị Cúc	Commune Environmental officer	Tô Hiệu Commune	2/2/2016
10	Lê Thị Thùy	Commune Land survey officer	Tô Hiệu Commune	2/2/2016
11	Nguyễn Thanh Truyền	Commune Land survey officer	Tô Hiệu Commune	2/2/2016
12	Đào Hồng Thái	Accountant	Tô Hiệu Commune	2/2/2016
13	Lê Minh Tiến	Vice Head of Tia street	Tô Hiệu Commune	2/2/2016
14	Lê Chí Sơn	Tử Dương Party Secretary	Tô Hiệu Commune	2/2/2016
15	Ngô Hồng Tâm	Tử Dương village Head	Tô Hiệu Commune	2/2/2016

ii. List of affect households participated in public consultation

#	Name	Male	Female	Village	Commue	District
1	Lê Trung Phan	x		Tử Dương	Tô Hiệu	Thường Tín
2	Lê Văn Hạnh	x		Tử Dương	Tô Hiệu	Thường Tín
3	Trần Thị Duyên		x	Tử Dương	Tô Hiệu	Thường Tín
4	Đặng Thạch Cương	x		Tử Dương	Tô Hiệu	Thường Tín
5	Đặng Ngọc Toàn	x		Tử Dương	Tô Hiệu	Thường Tín

6	Nguyễn Văn Thắng	x		Tử Dương	Tô Hiệu	Thường Tín
7	Vũ Văn Lợi	x		Tử Dương	Tô Hiệu	Thường Tín
8	Dương Thanh Tùng	x		Tử Dương	Tô Hiệu	Thường Tín

Some photos of public consultation in Tu Duong village-To Hieu commune

Appendix C: EMERGENCY RESPONSE PLAN

1. The Contractor must develop emergency or incident response procedures (ERP) during construction. In the operational phase the operator/civil authorities will have responsibility for any emergencies or serious incidents. The construction phase should ensure:

- Emergency Response Team (ERT) of the Contractor as initial responder;
- The District fire and police departments, emergency medical service, the Department of Public Health (DPH), collectively referred to as the External Emergency Response Team (EERT), as ultimate responders.

2. The Contractor will provide and sustain the technical requirements, human and financial resources for quick response during construction.

Table 1 Roles and Responsibilities in Emergency Incident Response

Entity	Responsibilities
Contractor Team (CERT)	- Communicates /alerts the EERT. - Prepares the emergency site to facilitate the response action of the EERT, e.g., vacating, clearing, restricting site. - When necessary and requested by the EERT lends support /provides assistance during EERT's response operations.
External Emergency Response Team (EERT)	- Solves the emergency/incident
Contractor Resources	- Provide and sustain the people, equipment, tools and funds necessary to ensure Subproject's quick response to emergency situations. - Maintain good communication lines with the EERT to ensure prompt help response and adequate protection, by keeping them informed of Subproject progress.

3. The CERT will be led by the senior Contractor engineer (designated ERTL) on site with a suitably trained foreman or junior engineer as deputy. Trained first-aiders and security crew will be the core members of the CERT.

4. The Contractor will ensure that CERT members are physically, technically and psychologically fit for their emergency response roles and responsibilities.

5. Prior to the mobilization of civil works, the Contractor, through its Construction Manager, ERTL, in coordination with the PO/PMB, will meet with the ultimate response institutions to discuss the overall construction process, including, but not limited to:

i) Subproject sites;

ii) Construction time frame and phasing;

iii) Any special construction techniques and equipment that will be used;

iv) any hazardous materials that will be brought to and stored in the construction premise and details on their applications and handling/management system;

v) the Contractor's Emergency Management Plan

vi) names and contact details of the ERT members

6. The objective of this meeting is to provide the ultimate response institutions the context for:

i) Their comments on the adequacy of the respective Emergency Management Plans.

ii) their own assessment of what types, likely magnitude and likely incidence rate of potential hazards are anticipated.

iii) The arrangements for coordination and collaboration.

7. To ensure effective emergency response, prior to mobilization of civil works, the Contractor will:

i) set up the CERT;

ii) set up all support equipment and facilities in working condition

iii) made arrangements with the EERT;

iv) conduct proper training of CERT members, and encouraged trained volunteers from the labour force;

v) conduct orientation to all construction workers on the emergency response procedures at grassroots level, particularly evacuation procedures, evacuation routes, among others; and

vi) conduct drills for different possible situations.

8. To sustain effective emergency response throughout Subproject implementation, an adequate budget shall be provided to sustain the capabilities and efficiency of the emergency response mechanism, the emergency response equipment, tools, facilities and supplies. Drills and reminders will take place regularly, the former at least every two months and the latter at least every month.

Alert Procedures

9. Means of communicating, reporting and alerting an emergency situation may be any combination of the following: i) audible alarm (siren, bell or gong); ii) visual alarm (blinking/rotating red light or orange safety flag); iii) telephone (landline); iv) mobile phone; v) two-way radio; and vi) public address system/loud speakers. Some rules relative to communicating/alerting will be:

(i) Whoever detects an emergency situation first shall immediately:

- call the attention of other people in the emergency site,
- sound the nearest alarm, and/or
- report/communicate the emergency situation to the CERT

(ii) Only the ERTL and, if ERTL is not available, the Deputy ERTL are authorized to communicate with the EERT. Exceptional cases to this rule may be necessary and should be defined in the Emergency Management Plans.

(iii) When communicating/alerting an emergency to the EERT, it is important to provide them with at least: i) the type of emergency situation; ii) correct location of the emergency; ii) estimated magnitude of the situation; iii) estimated persons harmed; iv) time it happened; v) in case of a spill, which hazardous substance spilled; and vi) in case of fire and explosion, what caused it. Such details would allow the EERT to prepare for the appropriate response actions. For an effective reporting/alerting of an emergency situation:

(i) The names and contact details of the relevant persons and institutions should be readily available in, or near to, all forms of communication equipment, and strategically posted (at legible size) in all Subproject sites and vehicles:

- Most relevant construction/operations staffs namely, the ERTL, Deputy ERTL, first-aiders, supervising engineers, foremen.
- EERT institutions/organizations.
- Concerned village authority/ies.
- PMB Office, SS.

(ii) All Subproject sites should have good access to any combination of audible and visual alarms, landline phones, mobile phones and two-way radio communication at all times.

(iii) Contractor's construction vehicles should also be equipped with the appropriate communication facilities.

Emergency Response Situations

The following tables suggest general procedures that will be refined in the final EMP during detailed design, and described in more detail in the Emergency Management Plans of the Contractor.

Table 2: Evacuation Procedure

Procedure	Remarks
Move out as quickly as possible as a group, but avoid panic	All workers/staff, sub-contractors, site visitors to move out, guided by the CERT
Evacuate through the directed evacuation route	The evacuation route shall have been determined fast by the ERTL/Deputy ERTL and immediately communicated to CERT members
Keep moving until everyone is safely away from the emergency site and its influence area	A restricted area must be established outside the emergency site, all to stay beyond the restricted area
Once outside, conduct head counts	Foremen to do head counts of their sub-groups; ERTL/Deputy ERTL of the CERT.
Report missing persons to EERT immediately	ERTL/Deputy ERTL to communicate with the EERT
Assist the injured in evacuation and hand them over to the CERT first-aiders or EERT medical group	CERT must manage injured persons to ensure proper handling.
If injury warrants special care, DO NOT MOVE them, unless necessary and instructed/directed by the EERT	ERTL/Deputy ERTL communicates with EERT to get instructions/directions in handling the injured.

Table 3: Response Procedure During Medical Emergency

Procedure	Remarks

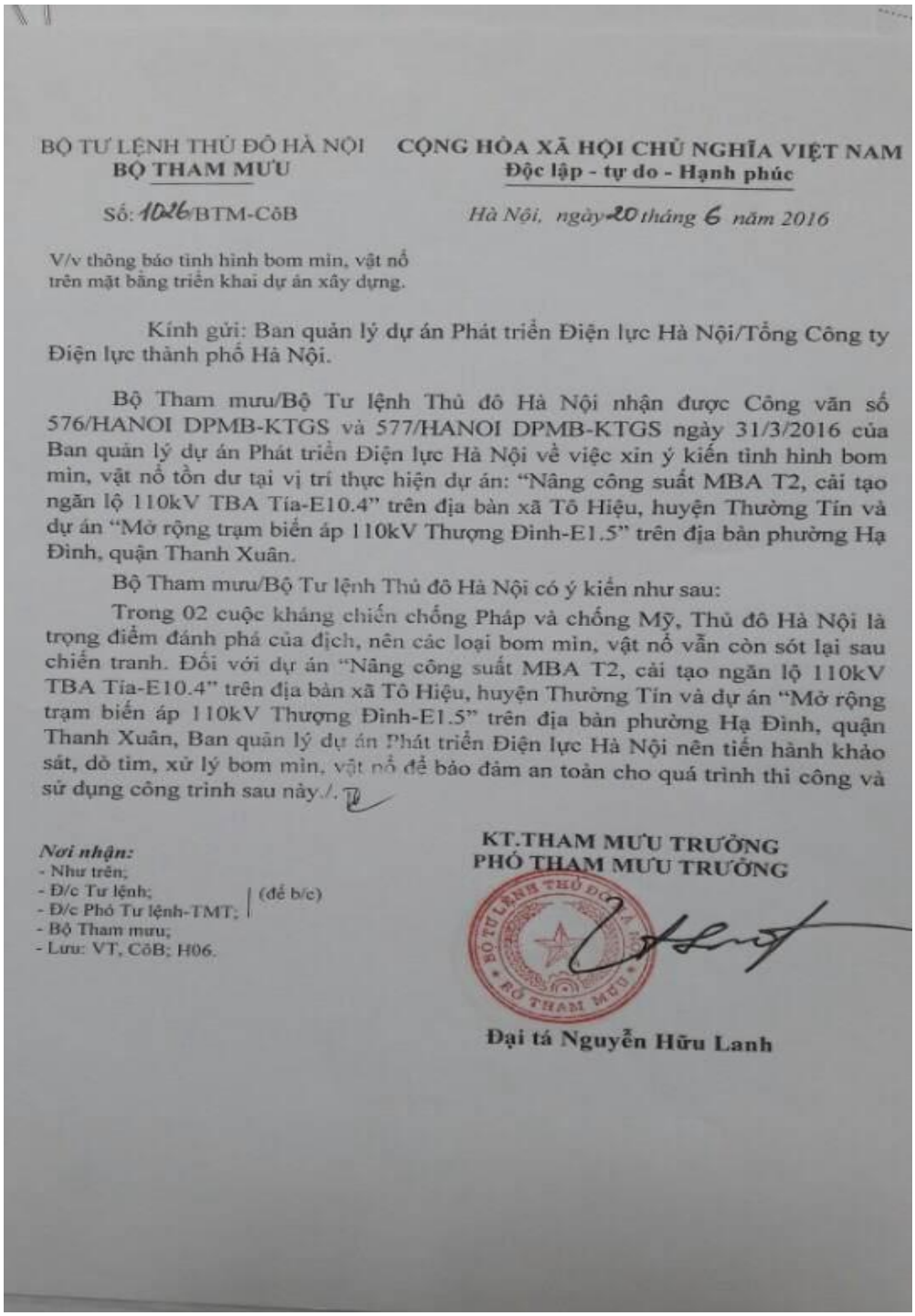
Administer First Aid regardless of severity immediately.	Fundamentals when giving First Aid: - Safety first of both the rescuer and the victim. - Do not move an injured person unless: - victim is exposed to more danger when left where they are, e.g., during fire, chemical spill - it would be impossible for EERT to aid victims in their locations, e.g., under a collapsed structure - instructed or directed by the EERT First AID to be conducted only by a person who has been properly trained in giving First Aid.
Call the EERT emergency medical services and/or nearest hospital.	ERTL/Deputy ERTL or authorized on-site emergency communicator
Facilitate leading the EERT to the emergency site	ERTL/Deputy ERTL to instruct: - an CERT member on site to meet EERT in access road/strategic location. He/she shall hold orange safety flag to get their attention and lead them to site. - Other CERT members to clear access road for smooth passage of the EERT
If applicable, vacate site and influence area at once, restrict site, suspend work until further notice.	Follow evacuation procedure

Table 4: Response Procedure in Case of Fire

Procedure	Remarks
Alert a fire situation	Whoever detects the fire shall immediately: - call the attention of other people in the site, - sound the nearest alarm, - any CERT member among the construction sub-group contacts the fire department (in this case it should be agreed on that it is alright for any CERT member in the sub-group to alert the fire department) - Report/communicate the emergency situation to the ERTL/Deputy ERTL.
Stop all activities/operations and evacuating	All (non-CERT) workers/staff sub-contractors, site visitors and concerned public to move out to safe grounds following the evacuation procedure
Activate CERT to control fire from spreading	Guided by the training they undertook, CERT members assigned to mitigate the fire shall assess their own safety situation first before attempting to control fire spread
Call the nearest fire and police stations, if applicable	When alerting the EERT, ERTL will give the location, cause of fire, estimated fire alarm rating, any injuries.
Facilitate leading the EERT to the emergency site	ERTL/Deputy ERTL to instruct: - An CERT member to meet the EERT in the access road or strategic location and lead them to the site. He/she shall hold the orange safety flag to get their attention and lead them to the site.

	- Some CERT members to control the traffic in the access road to facilitate passage of the EERT in location.
CERT evacuate the site as soon as, if applicable	Follow appropriate evacuation procedure

APPENDIX D. UXO CLEARANCE OFFICIAL LETTER



BỘ TƯ LỆNH THỦ ĐÔ HÀ NỘI
BỘ THAM MƯU

Số: 1026/BTM-CôB

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM
Độc lập - tự do - Hạnh phúc

Hà Nội, ngày 20 tháng 6 năm 2016

V/v thông báo tình hình bom mìn, vật nổ trên mặt bằng triển khai dự án xây dựng.

Kính gửi: Ban quản lý dự án Phát triển Điện lực Hà Nội/Tổng Công ty Điện lực thành phố Hà Nội.

Bộ Tham mưu/Bộ Tư lệnh Thủ đô Hà Nội nhận được Công văn số 576/HANOI DPMB-KTGS và 577/HANOI DPMB-KTGS ngày 31/3/2016 của Ban quản lý dự án Phát triển Điện lực Hà Nội về việc xin ý kiến tình hình bom mìn, vật nổ tồn dư tại vị trí thực hiện dự án: "Nâng công suất MBA T2, cải tạo ngăn lộ 110kV TBA Tía-E10.4" trên địa bàn xã Tô Hiệu, huyện Thường Tín và dự án "Mở rộng trạm biến áp 110kV Thượng Đình-E1.5" trên địa bàn phường Hạ Đình, quận Thanh Xuân.

Bộ Tham mưu/Bộ Tư lệnh Thủ đô Hà Nội có ý kiến như sau:

Trong 02 cuộc kháng chiến chống Pháp và chống Mỹ, Thủ đô Hà Nội là trọng điểm đánh phá của địch, nên các loại bom mìn, vật nổ vẫn còn sót lại sau chiến tranh. Đối với dự án "Nâng công suất MBA T2, cải tạo ngăn lộ 110kV TBA Tía-E10.4" trên địa bàn xã Tô Hiệu, huyện Thường Tín và dự án "Mở rộng trạm biến áp 110kV Thượng Đình-E1.5" trên địa bàn phường Hạ Đình, quận Thanh Xuân, Ban quản lý dự án Phát triển Điện lực Hà Nội nên tiến hành khảo sát, dò tìm, xử lý bom mìn, vật nổ để bảo đảm an toàn cho quá trình thi công và sử dụng công trình sau này./.

Nơi nhận:
- Như trên;
- Đ/c Tư lệnh; (để b/c)
- Đ/c Phó Tư lệnh-TMT; (để b/c)
- Bộ Tham mưu;
- Lưu: VT, CôB; H06.

KT.THAM MƯU TRƯỞNG
PHÓ THAM MƯU TRƯỞNG

Đại tá Nguyễn Hữu Lanh